



United States Department of Agriculture

Natural Resources
Conservation Service



Agriculture
& Markets

Program Opportunities for Producers to Improve Soil Health

Improving soil health is the right thing to do for both production and conservation. Moving to a higher level of soil health under intensive vegetable production can be a challenge from both a financial and logistical standpoint, but growers may already be implementing practices toward the goal. An effective soil health strategy is based on the following concepts:

- feeding and diversifying soil biota through a wider range of crops in rotation and organic matter inputs,
- managing more by disturbing the soil less,
- growing a living root year-round, and
- keeping the soil covered as much as possible.

Further improvement of soil health over time can lead to higher yields, improved product quality, soils more resilient to droughty and wet conditions (weather extremes), reduced pest pressure, improved nutrient recycling, and reduced outside inputs. Producers that have a plan in mind for improving their soil health, and are committed to moving to a higher level, may be at a point where putting a soil health conservation system on the ground aligns well with state and federal program opportunities.

The objective of an effective soil health strategy is to first determine where the weak links are in the current cropping system. Determination of a soil health resource concern may be in the form of visual soil indicators, less than optimum yields, high input cost, soil test results, and/or soil health modeling. Identifying the correct practice or system of practices, the extent and technical specifications of each practice needed for a successful system is the next step. Determining a point where each practice can be inserted into a current system in order to be effective and still maintain a producer's objective for crop timing and yield can be challenging especially for vegetable producers. An effective soil health strategy requires increased management intensity and may involve short term increases in labor and equipment cost while fine tuning the best system. Federal and state/local cost-share programs can significantly help offset some of these upfront costs. Technical Assistance for soil health planning and implementation is always available from local conservation professionals including local Natural Resources Conservation Service (NRCS), Soil and Water Conservation District (SWCD), Cornell Cooperative Extension (CCE), and private Technical Service Providers (TSPs). It is critical for conservation professionals to work with you to get the technical and timing aspects correct for practices needed to implement a comprehensive soil health management system. Once the technical components of a soil health system are planned, determining if implementation may fit into a cost-share program can be explored.

Whether working with NRCS, a Soil and Water Conservation District, Cornell Cooperative Extension, and/or a private-sector TSP, there are a host practices that can be employed on their own, or more often and better yet, together as systems to improve soil health. The table, below, outlines several of the common practices, often used together to achieve an effective, long-term strategy for soil health.

Common Conservation Practices Available to Build Soil Health Systems		
Practice	General Technical Requirements	Soil Health Strategy Achieved
Conservation Crop Rotation (328)	Introduction of a new resource conserving crop into the crop rotation. Close grown crops such as small grains qualify.	Increase diversity in the soil biosphere, increase soil cover, allows for increased flexibility to insert diverse cover crops into the over-all system.
Cover Crop (340)	Planting living cover during non-cropped periods of the crop year. Cover crops can be planted for fall, winter, spring, and summer periods. Follow specified seeding rates and planting dates depending on season and type of cover crop planned.	Provide living cover, living roots 24/7. Increase level of soil organic matter, bio-diversity, energy transfer to soil microbes, and nutrient recycling.
Residue and Tillage Management, No-Till/Strip Till/Direct Seed (329)	Change tillage methods from a full width system to one or two pass systems that leave at least 40% of the surface un-tilled.	Decrease soil disturbance, increase residue cover and soil organic matter.
Residue and Tillage Management, Mulch Till (345)	Change tillage methods from full width high disturbance inversion types to lower disturbance full width tillage such as vertical tillage and low disturbance chisels and disks. Generally requires a higher residue crop to gain benefits.	Decrease soil disturbance, increase residue cover and soil organic matter.
Nutrient Management (590)	Apply all plant nutrients and soil amendments according to the 4R concept (right place, right time, right rate, and right form). Requires qualified professional to develop the management plan. Producers needs to document nutrient applications with record keeping.	Increases nutrient cycling efficiency and increases plant condition. Recycles carbon and nutrients from manures and composts. Healthy crops lead to healthy soils.
Integrated Pest Management (595)	Use of prevention, avoidance, and mitigation techniques before making pest suppression decisions. Pest scouting and detailed record keeping required.	Increases plant condition, Healthy crops lead to healthy soils. Minimizes impact to soil microbes from pesticides.
Irrigation Water Management (449)	Scheduling of irrigation water in association with micro-irrigation systems. Water is applied based on plant needs and soil moisture status. Requires development of a plan and detailed record keeping	Reduces irrigation induced soil erosion and negative impacts on soil structure by over application of irrigation water.

Federal Program Opportunities:

The Environmental Quality Incentive Program (EQIP) offered through the Natural Resources Conservation Service provides significant funding opportunities for soil health practices listed in the table above.. EQIP offers payment for implementation of new practices on eligible cropland to address an existing documented resource concern such as degraded soil health and high erosion rates. Applications are ranked according to the magnitude of the resource concern addressed in a conservation plan. Multiple practices implemented as a system tend to be more effective and rank higher. Payment rates vary depending on the practice scenario to be implemented. For example, implementation of a Cover Crop practice could result in a payment applied to cost anywhere from around \$60/acre to \$100/ac. under the 2014 EQIP program. Higher payments are for more complex, higher cost cover crop mixes and where organic seed is required. Implementation of reduced tillage practices range from about \$13/ac to \$16/ac.in practice payments that are applied to towards implementation costs. Payments for the cost of implementing a new Conservation Crop Rotation may be in the range of \$14/ac to \$54/ac., again with higher payments for implementation of higher cost systems. Final payment rates for all practices are determined by the resource concerns identified and addressed through the

conservation plan. Growers can sign-up for EQIP on a continuous basis at their local USDA Service Center. In general, sign-up as early as possible in order to be considered for the next funding cycle due out in the next federal fiscal year that starts October 1st.

The Conservation Stewardship Program (CSP) is another Federal funding opportunity administered by NRCS. CSP offers payments where existing high levels of soil health and other natural resource stewardship can be demonstrated. For CSP, soil health practices have largely been implemented through a conservation plan in the past and are maintained on the cropland landscape. CSP applications are processed through a conservation measurement tool (CMT). If a grower is meeting a certain stewardship threshold and is willing to enhance certain practices on their farm with increased management intensity, they could be eligible for a lump sum yearly payment under CSP. The CSP payment is designed to assist with up-front operation and maintenance cost associated with maintaining conservation management systems on farms. Farms that have addressed resource concerns in the past through EQIP, state programs, or on their own with conservation management systems and are maintaining those systems may fit well into the CSP program. CSP applications are also taken on a continuous basis at USDA Service Centers. Sign-up as early as possible in order to be considered for the next funding cycle due out in the next federal fiscal year that starts October 1st. For more info on federal program opportunities to address soil health and other conservation objectives, visit <http://www.nrcs.usda.gov/wps/portal/nrcs/site/ny/home/>

State and Local Program Opportunities:

Through their local Agricultural Environmental Management (AEM) programming and with support from the NYS Department of Agriculture and Markets and the NYS Soil and Water Conservation Committee, county-based Soil and Water Conservation Districts offer technical assistance and cost-share opportunities for a wide-range of conservation practice systems, including those beneficial for soil health. The approach is centered on conserving natural resources in concert with the goals of farm businesses. Taking a stepwise approach, conservation professionals from your local District can help with:

- assessing existing stewardship and opportunities for improvement (Tiers 1 and 2),
- planning conservation systems to improve soil health, conserve soil, and benefit water quality (Tier 3),
- implementing those practice systems (Tier 4), and
- evaluating their performance over time (Tier 5).

Connecting with your local Soil and Water Conservation District is the best way to discuss specifics about AEM, technical assistance, cost-share opportunities (such as through the NYS Agricultural Nonpoint Source Abatement and Control Grants Program), and next steps. Contact info for your local District office can be found at:

www.agriculture.ny.gov/SoilWater/contacts/county_offices.html