United States Department of Agriculture
Natural Resources Conservation Service

Soil Quality Enhancement Activity – SQL05 – Use of Deep Rooted Crops to Break up Soil Compaction

Enhancement Description
This enhancement is for the use of deep rooted crops to break up compacted soils and improve soil quality. Deep rooted crops can be perennial plants like alfalfa or annual plants like forage radish.

Land Use Applicability
Cropland

Benefits
Soils can have naturally occurring compacted layers (hard pans) or those that have been created through tillage or other farming activities. Deep rooted crops with large taproots can alleviate the effects of soil compaction by penetrating the compacted layer, creating pore space that allows air, water and crop roots to penetrate deeper in the soil profile. Eliminating soil compaction through the use of deep rooted crops increases infiltration, reduces surface runoff, improves soil tilth and overall soil quality. It also eliminates the need for sub-soiling with a plow, thus saving fuel, reducing erosion and enhancing water quality.

Criteria for Use of Deep Rooted Crops to Break up Soil Compaction

- The selected crop must be one that has been identified as having the capability of alleviating soil compaction (state specific lists are available in NRCS Field Office Technical Guide).
- If perennial plants are used, once established, they must be maintained annually by proper fertilization and mowing/harvesting.
- Annual crops should be seeded early enough in the fall to allow for adequate growth to occur prior to winter (Follow NRCS 340 standard).
- No deep tillage is allowed to remove compacted layer.

Documentation Requirements for Use of Deep Rooted Crops to Break up Soil Compaction

1. Written documentation for each year of this enhancement describing the following items:
    - Deep rooted crops used and dated planted.
    - Cash crop planted and method used.
2. A map showing fields where the enhancement is applied.
3. Photographs of a representative number of fields showing deep rooted crops.

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State Criteria

Acceptable Deep Rooted Crops are: Alfalfa; Sweet Clover; Canola; Radish; Turnip; and any Sorghum, Sudangrass or Sudan/Sorghum hybrids seeded early enough in the summer to allow for adequate growth to occur prior to winter (Follow NRCS 340 standard).

Example1: Existing rotation is corn – beans – wheat. A turnip cover crop will be planted after wheat to break up soil compaction.

Cover crops must be planted whenever the crop they are scheduled to follow in the rotation is grown and rotated across all planned acres by the end of the contract period.

Cover Crop Requirements

- Cover crops can not be harvested or grazed
- Cover crops must follow planting dates, seeding rates, method of planting and other requirements in 340 Cover Crop Standard. Specifications will be provided on the Cover Crop Worksheet (NE-CPA-7).
- Cover crops which winter kill must planted at least 8 weeks prior to the average date of the first killing frost.
- Cover crops which over winter must have at least 4 weeks of spring growth before termination.
- Winter annual cover crops planted following a low residue crop must have a minimum of 6-8” of growth before they are terminated.
- Cover crop must be a different crop type (i.e. warm season grass, cool season grass, warm season broadleaf, cool season broadleaf) or, if a cover crop mix is used, include a different crop type than the previous crop.
- Cover crops which follow fall harvested crops must be winter annual small grains such as rye, wheat or triticale, or a winter annual small grain with a legume.

Example2: Existing rotation is continuous corn. Alfalfa will be added to the rotation to break up soil compaction.

Any crop added to an existing crop rotation must be scheduled by the third year and rotated across all planned acres by the end of the contract period.

Documentation

TABLE OF PLANNED AND APPLIED ACTIVITY – SQL05

Tract	Field(s)	Existing Rotation	Planned Rotation with Deep Rooted Crop	Deep Rooted Crop	Date Planted	Acres Planned	Acres Applied
1	*1*	*C-B-W*	*C-B-W-cc*	*Turnips*	*Aug. 1*	*50*	

C=Corn; B=soybeans/edible beans; W=Wheat; M=Milo; A=Alfalfa; O=Oats; cc=cover crop; Others=_____

I certify that the following information meets specifications and has been provided to NRCS:

1. Planned rotation, deep rooted crop grown, planting date and the number of acres where the enhancement was applied (Complete the above table.).
2. A map with delineation of the area where the enhancement was applied.
3. A completed Cover Crop Worksheet (NE-CPA-7) if deep rooted cover crops were included in the rotation.
4. Photographs of a representative number of fields showing deep rooted crops.

I understand that it is my responsibility to obtain all necessary permits and to comply with all laws, regulations and ordinances pertaining to the application of these activities.

Certified by: _____ Date:_____