

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

1. 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).
2. If perennial plants are used, once established, they must be maintained annually by proper fertilization and mowing/harvesting.
3. Annual crops should be seeded early enough in the fall to allow for adequate growth to occur prior to winter (Follow NRCS 340 standard).
4. No deep tillage is allowed to remove compacted layer.

Documentation Requirements

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

SOIL QUALITY ENHANCEMENT ACTIVITY

SQL05-OR Use of Deep Rooted Crops to Break Up Soil Compaction

General

Soil compaction occurs when moist or wet soil particles are pressed together and the pore spaces between them are reduced. Adequate pore space is critical for the movement of water, air, and microorganisms through the soil. Compacted soils restrict root penetration, making soil moisture unavailable and restricting root growth. Compaction results in increased surface runoff, nutrient losses, and ultimately reduced yields. The use of deep rooted crops with large taproots can alleviate these impacts by penetrating the compacted layer.

Oregon Criteria

The following crops are acceptable for use with this Enhancement:

- | | |
|----------------|--------------------|
| Alfalfa | Pine lupine |
| Camelina | Rapeseed |
| Canola | Red clover |
| Common vetch | Safflower |
| Crimson clover | Subclover |
| Flax | Sugar beets |
| Forage radish | Sunflower |
| Hairy vetch | Yellow sweetclover |

Other deep rooted crops with large taproots may be practical/feasible in your area. Contact the r NRCS State Agronomist for prior approval.

Documenting the Enhancement

1. **A map or aerial photo showing fields where the Enhancement is applied**
2. **Photographs of a representative number of fields showing deep rooted crops**
3. **Deep Rooted/Large Taproot Crop Planted (for each year of the Enhancement):**
 _____ **Date Planted** _____
4. **Cash Crop Planted:** _____ **Date Planted** _____
5. **Planting Method:**
 ___ **NoTill/Direct Seed** ___ **Mulch Tillage** ___ **Conventional Tillage**

References

USDA-NRCS, *Soil Quality-Agronomy Technical Note #17: Soil Compaction*, Soil Quality Institute, Auburn, AL, June 2003.

Oregon State University Extension Service, *Oregon Cover Crop Fact Sheets*.
<http://extension.oregonstate.edu/catalog/details.php?sortnum=0124&name=Cover+Crops>