

## 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.



United States Department of Agriculture  
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**Additional guidance for deep rooted crops:**

Effective deep rooted crops will have approximately 80 percent of the feeder roots in a deep uniform, well-drained soil profile. The following is a list of deep rooted crops that break up compacted soils and improve soil quality.

<u>Crop</u>	<u>Depth in feet</u>
Alfalfa	4-6
Beets (sugar)	3-5
Canola	2-4
Safflower	3-5
Forage radish	1-2

For additional information on deep rooted crops, refer to:

NRCS National Engineering Handbook, Section 15, Chapter 11 – *Sprinkler Irrigation*.  
<http://ucmanagedrought.ucdavis.edu/CropRootingDepth.cfm>