

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.



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Reference: 340 – Cover Crop

The following are crops that have the capability of alleviating soil compaction and are considered deep rooted crops:

Species	Seeding Rate	Seeding Depth (inches)	Seeding Date	Comments
Alfalfa	12 lbs/ac	¼ to ½	April 15 - June 15 OR Aug 1 - Sept 15	
Radish	8 - 12 lbs/ac	¼ to ½	June 1 - Sept 15	Drilled or broadcast and incorporated. Best suited for early fall growth after small grain, vegetable, corn silage or early soybean harvest.
Sugarbeets	8 lbs/ac	½ to ¾	Late April to Early May	
Red Clover	8 - 10 lbs/ac	¼ to ½	April 15 - June 15 OR Aug 1 - Sept 15	Good on somewhat poorly drained sites and potato fields with moderate pH. Prefers drilling to broadcast.
Safflower	30 lbs/ac	1 to 1½	Early to Mid-May	
Sorghum - Sudan	25 - 30 lbs/ac	½ to 1	May 15 - July 1	Advantageous to use on well drained and droughty sites.
Sunflower	4 lbs/ac	½ to 1	May 25 - June 1	
Sweetclover	8 - 10 lbs/ac	¼ to ½	Early spring into small grain OR Aug 1 - Sept 15	Advantageous to use on well drained and droughty sites. Prefers drilling to broadcast. May become invasive if allowed to seed out. Hard seed will remain viable in soil for many years.

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Conservation Stewardship Program

Minnesota 2011 Ranking Period 1

Species	Seeding Rate	Seeding Depth (inches)	Seeding Date	Comments
Turnips	1- 4 lbs/ac	¼ to ½	July 15 - Aug 15	Fast growing and tolerate cold temperatures. Broadcast or drilled.

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