United States Department of Agriculture
Natural Resources Conservation Service

Soil Erosion Enhancement Activity – SOE03 - Continuous No Till (Organic System)

Enhancement Description
This enhancement is for using a continuous no-till, strip till or direct seeding method of planting throughout the planned rotation on an organic farm. High residue levels are maintained by including high residue-producing crops, or by low residue crops followed by a cover crop in the rotation. Termination of all cover crops is accomplished using non-chemical methods, such as flail mowing, roller crimper and frost kill. No herbicides are used for weed control.

Land Use Applicability
This enhancement is applicable on cropland that is certified as organic or on conventional acreage that is being transitioned for organic certification.

Benefits
Use of continuous no-till, strip till or direct seeding leaves high levels of crop residue that can reduce erosion by wind and water up to 90%, increase soil organic matter, and control weeds. Mechanically terminating cover crops using a flail mower or roller crimper can eliminate the use of herbicides, thereby reducing potential offsite water quality problems while leaving the soil undisturbed.

Criteria
Implementation of this enhancement requires the use of continuous no-till, strip till or direct seeding on all crops during the planned rotation that is part of an organic system plan. The no-till, strip till or direct seeding system must incorporate the following activities:

1. Rotations that include only high residue producing crops
    a. No cover crop required
    b. Use only crops that produce high residue levels throughout the rotation, e.g. corn, wheat
    c. Maintain a minimum of 90% residue cover on the soil surface after no-till, strip till or direct seed planting all crops
2. Rotations that include low residue crops
    a. Use a cover crop after ALL low residue crops, e.g. vegetables, cotton, soybeans
    b. Plant cover crops using a no till system
    c. Maintain a minimum of 90% residue cover on the soil after no-till planting all crops

   d. Use warm-season cover crops between spring and late summer crops or prior to late summer vegetable production

3. Additional Criteria
   a. All residues must be uniformly distributed over the entire field
   b. No full-width tillage is permitted regardless of the depth of the tillage operation
   c. Field(s) must have a soil loss at or below the tolerance (T) level for wind and/or water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of 30 or less for each planted crop or cover crop in the rotation
4. No Herbicides are used for weed control
5. Termination of all cover crops is accomplished using non-chemical methods, such as flail mowing, roller crimper and frost kill

Documentation Requirements

- Planned crop rotation showing cover crops that will be used after low residue crops
- Planting method used for each crop in the rotation (no-till, strip till, direct seeding)
- List of all other potential ground disturbing farming operations
- Method of cover crop termination, e.g. flail mowing, roller crimper
- Dates for farming operations
- Map showing fields, acreage
- Photographs of planted crops

United States Department of Agriculture
Natural Resources Conservation Service

IDAHO ADDENDUM 2009
Soil Erosion Enhancement Activity – SOE03 – *Continuous No Till (Organic System)*

Additional guidance for continuous no till:

Table 1.High residue producing crops.

Crop	Lbs. Residue per Bushel
Barley	65
Corn (sweet)	55
Corn (grain)	55
Flax	80
Oats	60
Rye	80
Sorghum (grain)	70
Milo	80
Millet	80
Teff	6 lbs residue per lb seed
Triticale	100
Wheat winter	90

Table 2. Legume cover crop species with associated agronomic data.

Cover Crop Species	Life Cycle	Potential Fixed Nitrogen (lbs/A)	Seeding Rate (lbs/A)	Seeding Depth (inches)	% Nitrogen Content[1]	Rhizobium Inoculant Type
Legumes						
Annual medic*	SA	40-100	10-40	1/4 to1/2	1.5	A
Berseem clover*	SA	60-90	9-20	1/4 to1/2	2.6	R
Crimson clover*	SA	50-60	12-20	1/4 to1/2	2.7	R
Austrian peas	SA / WA	30-100	70-150	1 to 2	2.2	C
Hairy vetch	WA	60-180	25-40	1/4 to1/2	3.7	C
Mammoth red clover	B	60-70	8-15	1/4 to1/2	2.9	B
Sweetclover (yellow)	B	70-90	8-15	1/4 to1/2	3.1	A

Alfalfa	P	50-150	9-25	1/4 to1/2	3.3	A
White clover	P	60-100	5-7	1/4 to1/2	3.9	B
Medium red clover	P	60-70	10-15	1/4 to1/2	2.9	B
Alsike clover	P	60-70	4-10	1/4 to1/2	2.9	B

*Cover crops not commonly used in Idaho
[1] Dry weight basis, data from USDA Plant data base and UC SAREP online Cover crop database (http://www.sarep.ucdavis.edu/ccrop/)

Table 3. Non Legume cover crop species with associated agronomic data.

Species	Life Cycle	% Nitrogen Content[1]	Seeding Rate (lbs/A)	Seeding Depth (inches)
Buckwheat*	SA	1.25	35-60	1/4 to1/2
Forage turnips	SA	3.3	3-5	1/4 to1/2
Forage radish	SA		10-15	1/4 to1/2
Oilseed radish	SA	3.8 tops 2.5 roots	25	1/4 to1/2
Mustards (White)	SA	3.5	15	1/4 to1/2
Mustards (Oriental)	SA	3.5	10	1/4 to1/2
Canola / Rape	SA/WA	3.5	15	1/4 to1/2
Annual ryegrass	SA	1.3	15-25	1/4 to1/2
Barley	SA / WA	2.2	50-100	1 to 2
Rye	SA / WA	2.8	50-100	1 to 2
Triticale	SA / WA	2.0	50-100	1 to 2
Wheat	SA / WA	2.3	50-100	1 to 2
Oats	SA	2.1	35-70	1 to 2
Sudangrass	SA	1.3	20-60	1 to 2

*Cover crops not commonly used in Idaho
1 Data from USDA Plant data base and UC SAREP online Cover crop database (http://www.sarep.ucdavis.edu/ccrop/)
Notes:
Life cycles: P = perennial, WA = winter annual, SA = summer annual, B = biennial
Nitrogen values vary depending on cover crop densities (biomass produced) and date of planting
Use any of the non-legume cover crop species to scavenge nitrogen left in the soil, refer to CSP enhancement WQL10.