

Soil Erosion Enhancement Activity – SOE01 - Continuous No Till with High Residue



Continuous No Till/Strip Till/Direct Seed

Utilize continuous no-till/strip till/direct seed in the rotation in combination with high and low residue producing crops or cover crops to maintain a high level of residue cover through critical erosion periods.

Land Use Applicability

This enhancement is applicable on cropland.

Benefits

High levels of surface residue with continuous no-till/strip till/direct seed reduce erosion by wind and water by up to 90%. The result is increased soil organic matter compared to intensively tilled soils with no surface residue protection. This will in turn, enhance and protect water quality and biotic communities that depend on clean water.

Criteria

Implementation of this enhancement **requires** the use of continuous no-till/strip till/direct seed. The no-till/strip till/direct seed system must incorporate 1 or more of the following activities.

1. Maintain high level of residue cover after no-till planting all crops in the rotation.
 - a. Utilize high residue crops in the rotation
 - b. Maintain a minimum of 50% residue cover after no-till planting all crops.
2. Use high residue cover crops to provide adequate residue for no-till planting after or between low residue crops in rotation.
 - a. Utilize high and low residue crops in the rotation
 - b. Use no-till to plant high residue cover crops between two low residue annual crops
 - c. Maintain a minimum of 50% residue cover after no-till planting all crops.
3. Low disturbance no-till planting and moderate level of residue cover after or between low residue crops in rotation.
 - a. Utilize high and low residue crops in the rotation
 - b. After high residue crops, maintain a minimum of 50% residue cover after no-till planting
 - c. After low residue crops use low disturbance no-till planting; maintain a Soil Tillage Intensity Rating (STIR) ≤ 20 and a minimum of 30% residue cover after planting.



In addition, each field must also have the 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.

Documentation Requirements

- Crop rotation records including rotation length in years, crops and cover crops planted.
- Sequence and description of operations for each crop and/or cover crop including harvest, residue conditioning, nutrient placement and planting/seeding.



United States Department of Agriculture
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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 to 1/2	1.5	A
Berseem clover*	SA	60-90	9-20	1/4 to 1/2	2.6	R
Crimson clover*	SA	50-60	12-20	1/4 to 1/2	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 to 1/2	3.7	C
Mammoth red clover	B	60-70	8-15	1/4 to 1/2	2.9	B
Sweetclover (yellow)	B	70-90	8-15	1/4 to 1/2	3.1	A

Alfalfa		P	50-150	9-25	1/4 to 1/2	3.3	A
White clover		P	60-100	5-7	1/4 to 1/2	3.9	B
Medium red clover		P	60-70	10-15	1/4 to 1/2	2.9	B
Alsike clover		P	60-70	4-10	1/4 to 1/2	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 to 1/2
Forage turnips	SA	3.3	3-5	1/4 to 1/2
Forage radish	SA		10-15	1/4 to 1/2
Oilseed radish	SA	3.8 tops 2.5 roots	25	1/4 to 1/2
Mustards (White)	SA	3.5	15	1/4 to 1/2
Mustards (Oriental)	SA	3.5	10	1/4 to 1/2
Canola / Rape	SA/WA	3.5	15	1/4 to 1/2
Annual ryegrass	SA	1.3	15-25	1/4 to 1/2
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.