Soil Erosion Enhancement Activity – SOE04 - Continuous no-till

Enhancement Description
This enhancement is for using a continuous no-till, strip till, or direct seeding method of planting throughout the planned rotation. 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 chemical methods or non-chemical methods, such as flail mowing, roller crimper and frost kill.

Land Use Applicability
Cropland

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%. The result is increased soil organic matter and added weed control as compared to intensively tilled soils with no surface residue. This will in turn, enhance and protect water quality and biotic communities that depend on clean water. 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.

Conditions Where Enhancement Applies
This enhancement applies to all acres of annually planted cropland.

Criteria
Implementation of this enhancement **requires** the use of continuous no-till, strip till, or direct seeding of all crops in the planned rotation. 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 is required if a Soil Tillage Intensity Rating (STIR) $\leq$ 10 is maintained for the rotation.
    b. Cover crops, if required:
        i. Can be a single grass species or a multiple species mixture that includes at least 50% grass or legume adapted for the local area
        ii. Must be planted using a no-till system
    c. Use only crops that produce high residue levels throughout the rotation, e.g. corn, wheat

   d. Residue removal is prohibited (Exception: residue removal is allowed for optimal crop production where SCI (Soil Conditioning Index) can be maintained greater than zero and the criterion of 3(c) is still met).
2. Rotations that include low residue crops
   a. Cover crops must be used after ALL low residue crops, e.g. vegetables, cotton, soybeans
   b. Plant cover crops using a no till system
   c. Cover crops can be a single grass species or a multiple species mixture that includes at least 50% grass or legume adapted for local use.
   d. Maintain a minimum Soil Tillage Intensity Rating (STIR) $\leq$ 10 for the planned rotation
   e. Residue removal is prohibited
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 soil tolerance (T) level for wind and/or water erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of $\leq$ 10 for each rotation

Adoption Requirements
This enhancement is considered adopted when the STIR criteria, residue and/or cover crops listed above have been implemented on the land use acreage.

Documentation Requirements
Documentation for each field where this enhancement is applied:
1. Planned crop rotation showing cover crops that will be used after low residue crops,
2. Planting method used for each crop in the rotation (no-till, strip till, direct seeding),
3. List of all other potential ground disturbing farming operations,
4. Method of cover crop termination, e.g. chemical, flail mowing, roller crimper, or combination,
5. Dates for farming operations,
6. Map showing fields and acreage, and
7. Photographs of planted crops.

Indiana CSP Enhancement Supplemental Information

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- The **STIR** value is the **Soil Tillage Intensity Rating**. The RUSLE 2 software program utilizes the speed, depth, surface disturbance percent and tillage type parameters to calculate a tillage intensity rating for the system used in growing a crop or a rotation. STIR ratings tend to show the differences in the degree of soil disturbance between systems. The greater the disturbance, the higher STIR.

Crop Residue and Cover Crop List

Low Residue Crops 1/	High Residue Crops 2/	Cover Crops 3/
Soybeans, Corn silage, Beans (dry edible), Cucumbers, Green peas, Green beans, Lima beans, Melons, Peppers, Pumpkins, Squash, Strawberries, Tomatoes, Vegetables, or similar crops	Corn (grain, sweet), Wheat, Barley Milo, Oats, Millet, Popcorn, Rye, Sorghum, Sorghum-Sudangrass Hybrids, Triticale	Radish- (forage, oilseed), Alsike Clover, Annual Ryegrass, Barley, Buckwheat, Canola/rape, Cowpeas, Crabgrass (red river), Crimson Clover, Field Peas/winter peas, Hairy Vetch, Mustards, Oats, Red Clover, Rye, Sorghum-Sudangrass Hybrids, Sweet clover, Triticale, Turnips, Wheat, Woollypod Vetch
1/ Full/partial-season crops managed with cover crops	2/ Full-season crops managed to leave 50 percent or more residue cover. Not harvested for silage or biomass.	3/ Cover to be established early enough in growing season to provide adequate cover