

**Energy Enhancement Activity – ENR01 – Fuel use reduction for field operations**



**Enhancement Description**

This enhancement is for fuel savings of 20% or more achieved by a reduction in field operations when compared to existing management system.

**Land Use Applicability**

Cropland

**Benefits**

In addition to saving money the advantages of fossil fuel conservation include reducing air pollutants such as greenhouse gas emissions, and decreasing reliance on foreign oil.

**Conditions Where Enhancement Applies**

This enhancement applies to all crop land use acres.

**Criteria**

1. Implementation of this enhancement requires that the participant reduce their field operations to achieve fuel savings of 20% or greater over their present baseline use.
2. Reduced trips across the field, and reduced tillage intensity are documented by using RUSLE2 to compare the planned tillage operations with present baseline tillage operations. The RUSLE2 user must ensure the energy data in RUSLE2 is current.

**Adoption Requirements**

This enhancement is considered adopted when the present baseline fuel consumption for all field operations is calculated using RUSLE2, at the time of application, and the comparison of the baseline to the planned reduced field operations, also calculated with RUSLE2, is  $\geq 20\%$ .

**Documentation Requirements**

Documentation of the fields where field operations have changed

**References**

Crop Budgets - Nebraska Cooperative Extension EC04-872-S (Revised 2004)

Energy Efficiency Programs in Agriculture: Design, Success, and Lessons Learned, Elizabeth Brown, R. Neal Elliot, and Steven Nadel, January 2005, Report Number IE051, American Council for an Energy-Efficient Economy.

## Michigan Supplement

### ENR01

Producers requesting payment for this enhancement must attach the following documentation for all fields. The Revised Universal Soil Loss Equation or RUSLE 2 model was used to make this record. Use the Fuel Use Report Print Option in RUSLE 2 to document the fuel saved by crop year or crop rotation as needed, see the sample below.

### RUSLE2 Profile Erosion Calculation Record

**Info:** Fuel Use Reduction Calculation before the conservation plan is implemented.

**File:** profiles\default

**Access Group:** R2\_NRCS\_Fld\_Office

#### Inputs:

Location	Soil	Slope length (horiz)	Avg. slope steepness, %
Michigan\Berrien County	Berrien County, Michigan\25 LENAWEE SILTY CLAY LOAM\Lenawee silty clay loam 84%	100	1.0

Management	Vegetation	Yield units	Yield (# of units)
CMZ 04\A.Single Year/Single Crop Templates\ROW CROPS\Corn grain\corn grain;FP z4	Corn, grain	bushels	112.00

Contouring	Strips/barriers	Diversion/terrace, sediment basin	Subsurface drainage	Adjust res. burial level	General yield level	Rock cover, %
a. rows up-and-down hill	(none)	(none)	(none)	Normal res. burial	Set by user	0

#### Outputs:

T value	Soil loss erod. portion	Detachment on slope	Soil loss for cons. plan	Sediment delivery	Net C factor	Net K factor	Crit. slope length	Surf. cover after planting, %
5.0	1.2	1.2	1.2	1.2	0.23	0.26		6.5

Date	Operation	Vegetation	Surf. res. cov. after op, %
11/1/0	Plow, moldboard		3.4
4/21/1	disk, tandem light finishing		2.1
4/28/1	Cultivator, field 6-12 in sweeps		6.5
5/1/1	planter, double disk opnr	Corn, grain	6.5
10/20/1	Harvest, killing crop 50pct standing stubble		70

#### FUEL USE EVALUATION: Before implementing Conservation Plan

Fuel type for entire run	Equiv. diesel use for entire simulation	Energy use for entire simulation	Fuel cost for entire simulation, US\$/ac
(none)	6.0	830000	18

#### SCI and STIR Output

Soil conditioning index (SCI)	Avg. annual slope STIR	Wind & irrigation-induced erosion for SCI, t/ac/yr
0.3	113	0

## RUSLE2 Profile Erosion Calculation Record

**Info:** Fuel Use Reduction Calculation after conservation plan is implemented.

**File:** profiles\default

**Access Group:** R2\_NRCS\_Fld\_Office

**Inputs:**

Location	Soil	Slope length (horiz)	Avg. slope steepness, %
Michigan\Berrien County	Berrien County, Michigan\25 LENAWEE SILTY CLAY LOAM\Lenawee silty clay loam 84%	100	1.0

Management	Vegetation	Yield units	Yield (# of units)
CMZ 04\A.Single Year/Single Crop Templates\ROW CROPS\Corn grain\corn grain;NT z4	Corn, grain	bushels	112.00

Contouring	Strips/barriers	Diversion/terrace, sediment basin	Subsurface drainage	Adjust res. burial level	General yield level	Rock cover, %
a. rows up-and-down hill	(none)	(none)	(none)	Normal res. burial	Set by user	0

**Outputs:**

T value	Soil loss erod. portion	Detachment on slope	Soil loss for cons. plan	Sediment delivery	Net C factor	Net K factor	Crit. slope length	Surf. cover after planting, %
5.0	0.12	0.12	0.12	0.12	0.024	0.26		76

Date	Operation	Vegetation	Surf. res. cov. after op, %
5/1/0	Planter, double disk opnr w/fluted coulter	Corn, grain	76
10/20/0	Harvest, killing crop 50pct standing stubble		79

**FUEL USE EVALUATION After adopting No till**

Fuel type for entire run	Equiv. diesel use for entire simulation	Energy use for entire simulation	Fuel cost for entire simulation, US\$/ac
(none)	2.5	340000	7.5

**SCI and STIR Output**

Soil conditioning index (SCI)	Avg. annual slope STIR	Wind & irrigation-induced erosion for SCI, t/ac/yr
0.9	2.59	0

**Fuel use reduction calculation: 6.0-2.5=3.5 gpa or 3.5 gpa fuel saved with conservation planned.**

For CStP fuel savings achieved by a reduction in field operations must be 20% or greater.