



Soil Tillage Intensity Rating (STIR)

Soil Tillage Intensity Rating is a numerical value calculated using RUSLE2. It is based on factors determined by crop management decisions being implemented for a particular field. Lower numbers indicate less overall disturbance to the soil layer. By definition, No-Till operations require a STIR value of 30 or less, from non full-width tillage implements. Values may range from 0 to 200 with a low score preferred. STIR Value reflects the kind of soil disturbance as well as the severity of the disturbance caused by tillage operations.

Specific components of the STIR value include:

- **Operational speed of tillage equipment**
- **Tillage type**
- **Depth of tillage operation**
- **Percent of the soil surface area disturbed**

Low STIR values reduce likelihood of sheet and rill and wind erosion. Other benefits of low STIR values include increasing Organic Matter (OM) content of the soil, less OM break down, lower carbon losses from soil to the atmosphere, improved soil consolidation conditions, and greatly improved infiltration rates.

Tillage operations greatly affect STIR values. Reducing tillage and choosing No-Till operations will greatly improve STIR ratings. Additional management decisions such as using soil conserving crops (alfalfa and grass) in the rotation will also lower STIR values across the rotation. STIR values are cumulative. The total value for a rotation is calculated by adding all the operations for the entire rotation and dividing by the number of years in the rotation.

Example: 2Year Rotation

CROP	OPERATION	STIR
	Chisel, straight point	45.50
	Disk, tandem secondary operation	32.50
	Disk, tandem light finishing	19.50
Corn, grain	Planter, double disk opener w/fluted coulter	2.43
	Harvest, killing crop	0.15
Soybean	Drill	2.43
	Harvest, killing crop	0.15
Your Soil Tillage Intensity Rating (STIR) is:		51.33

STIR values are calculated as part of the Revised Universal Soil Loss Equation Version 2 (RUSLE 2). STIR values can also be generated by using the Soil Tillage Intensity Rating website, <http://stir.nrcs.usda.gov/>. RUSLE 2 generated values will be used in conservation planning. The RUSLE 2 program and databases are available at http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm.

Inside of RUSLE 2 you can find the STIR for your rotation under the worksheet view or in the Soil Conditioning Index (SCI) box, see the examples below.

RUSLE2 Version 1.26.6.4 (Nov 13 2006)

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Plan: Worksheet (Field[1]) of AG 102 Test

Tract #
Field name: "Field number"

Compare management alternatives for a single hillslope profile

Location: CHROME SILT LOAM, 8 TO 15 PERCENT SLOPES, MODERATELY ERODED\CHROME silt loam 100%
Slope length (along slope): 150
Avg. slope steepness, %: 15
T value, t/ac/yr: 2.0

Management alternative table

Temp. scenario	Management	Yield values	Residue values	Contouring	Diversion/trace, sediment basin	Rock cover, %	Cons. plan, soil loss, t/ac/yr	Sed. delivery, t/ac/yr	Cover values	Soil conditioning index (SCI)	Wind & irrigation-induced erosion for SCI, t/ac/yr	STIR value	Show in summary?
Profile	-- mixed --	Yields	inputs	n hill	(none)	0	15	10	cover	g index	0	69.1	Yes

Finished calculating

R2_NRCS_Fld_Office | NRCS simple SCI 110606 | mosesA

Plan: Soil conditioning index (Soil conditioning index)...

Wind & irrigation-induced: 0

SCI OM subfactor: -0.023

SCI FO subfactor: 0.32

SCI ER subfactor: 8.6

Avg. annual slope STIR: 69.1

Soil conditioning index (SCI): -2

Annual STIR Values by Crop Year

Start date, m/d/y	End date, m/d/y	Veg	STIR value
9/15/3	9/15/1	vegetation\Corn, silage	100
9/15/1	9/15/2	vegetation\Corn, silage	100
9/15/2	9/15/3	vegetation\Corn, silage	100

Management 1 / Management 2 /

No-Till and Strip Till operations that meet the PA Practice Standard, 329-RESIDUE AND TILLAGE MANAGEMENT: NO TILL/STRIP TILL/DIRECT SEED will have single year STIR values of less than 30 and will typically be below 15.

Conservation Tillage operations that meet the PA Practice Standard, 345-RESIDUE AND TILLAGE MANAGEMENT: MULCH TILL will have single year STIR values of no greater than 60. These operations will also typically leave greater than 30% residue at planting.