

Soil Tillage Intensity Rating (STIR)



Texas Farmer with No till Equipment

What is the STIR Value?

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. In Texas, No-Till operations require a crop interval STIR value no greater than 20 during the planned rotation.

What factors are part of the STIR value?

STIR Value reflects the kind of soil disturbance as well as the severity of the disturbance caused by tillage operations. Values may range from 0 to 200 with a low score preferred. Specific components of the STIR value include:

1. Operational speed of tillage equipment and how this effects residue burial.
2. Tillage type (disk, chisel, bedder, no-till, etc.) - describes how the operation mixes the soil and associated residue.
3. Depth of tillage operation and the depth to which the residue is incorporated.
4. Percent of the soil surface area disturbed by tillage equipment. A plow is designed to disturb 100% of the soil surface, where as a no-till planter cuts a 3" slot and disturbs approximately 10% of the soil surface.

Why does STIR value matter to soil health?

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 in soil, improved soil consolidation conditions, and greatly improved infiltration rates.

What can you do to lower your STIR Value?

Tillage operations greatly affect STIR values. Reducing tillage and choosing No-Till operations will greatly improve STIR ratings. Additional management decisions such as using cover crops between cash grain crops and soil conserving crops (alfalfa and grass) in the rotation will also lower STIR values.