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USDA Natural Resources Conservation Service Science and Technology

2015 Conservation Webinars



Today's Webinar Presenter
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Date	2015 Conservation Webinars Topics
July 21	Overview of Tillage Implements for use in RUSLE2 Calculations: Focus on New Implements and Manure and Pesticide Incorporation
July 28	Silviculture for Non-foresters: Managing a Forest for Multiple Objectives
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Aug 4	Opportunities for Conservation in Organic Livestock Systems
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Overview of Tillage Implements for use in RUSLE2 Calculations:

Focus on New Implements and Manure Incorporation
and Pesticide Application

Giulio Ferruzzi

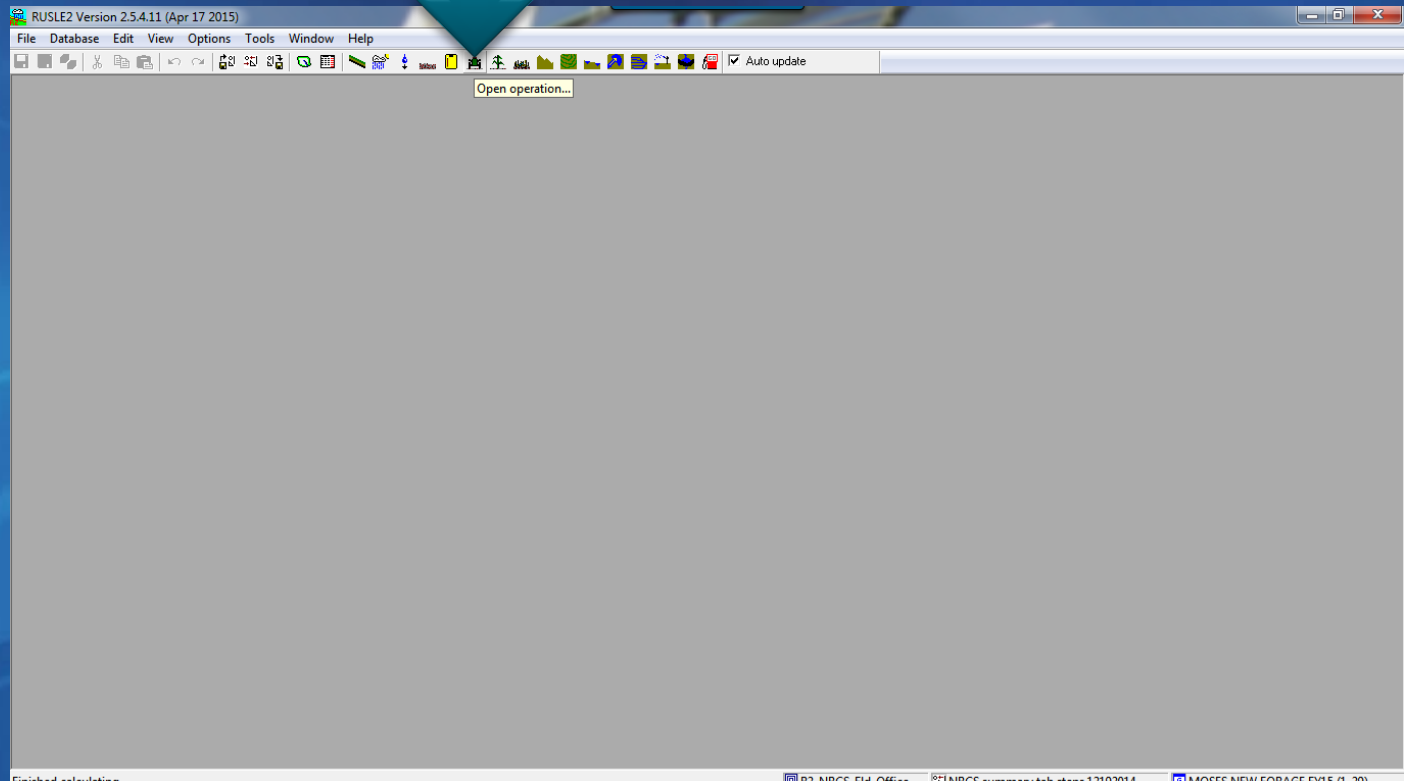
Conservation Agronomist

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West National Technology Support Center
(WNTSC)

















































Tillage Implements are called “Operations” in RUSLE2

- In RUSLE2 you can click on the “tractor” icon to bring up the full list of operations available to the user.



RUSLE2 Operation Records

- There are 579, and counting, operation records in RUSLE2.

 Add PAM	 Bedder, hipper, hiller 12 in high
 Add mulch	 Bedder, hipper, hiller 15 in high
 Aerator, field surface, ground driven	 Bedder, hipper, hiller 18 in high
 Aerator, field surface, ground driven 0 degree offset	 Begin growth
 Aerator, field surface, ground driven 10 degree offset	 Begin new growth
 Aerator, field surface, ground driven 5 degree offset	 Begin new style veg regrowth
 Aerator, single drum, lugs, angle 0	 Begin weed growth
 Aerator, tandem drum, lugs, angle 10	 Bulldozer, clearing/cutting
 Aerator, tandem drum, lugs, angle 5	 Bulldozer, clearing/cutting light
 Aerial interseeding	 Bulldozer, filling/leveling
 Aerial seeding	 Burn residue
 BFM applicator	 Burn residue, high intensity
 Bale Corn husk, cob and chaff windrows	 Burn residue, low intensity
 Bale Corn stalk strips	 Burn residue, mod. high intensity
 Bale combine windrows	 Burn residue, moderate intensity
 Bale corn stover	 Burn sugarcane
 Bale straw or residue	 Burrowing, heavy, Prairie dog
 Bed shaper	 Burrowing, light, Prairie dog
 Bed shaper high disturbance	 Burrowing, moderate, Prairie dog
 Bed shaper, 12 in	 Chisel plow, coulter, st. pts.
 Bed shaper, 12 in, low flattening	 Chisel plow, coulter, st. pts., cover disks
 Bed shaper, low flattening, high disturbance	 Chisel plow, coulter, st. pts., cover disks, ring basket
 Bedder, hipper, disk hiller	 Chisel plow, coulter, sweeps
 Bedder, hipper, disk hiller after small grains	 Chisel plow, coulter, twst. pts. . . .

RUSLE2 Operation Records

There are many different kinds of operation records including:

- Tillage
- Planters
- Sprayers
- Harvesters
- Grazing
- Mowers
- Others

Sprayer Records

- First records were created in 2001-2004.
- Many more records created in 2011-2012 in response to the possibility of other tools using the RUSLE2 data.

Spray, glyphosate on resistant growing crop	06/14/2012...
Sprayer, backpack, kill vegetation	03/31/2011...
Sprayer, backpack, post emergence	03/31/2011...
Sprayer, defoliant	04/06/2012...
Sprayer, fungicide	08/22/2011...
Sprayer, fungicide and insecticide tank mix	10/12/2011...
Sprayer, growth regulator	08/22/2011...
Sprayer, insecticide post emergence	06/23/2006...
Sprayer, kill cover in growing crop	04/06/2012...
Sprayer, kill cover in growing vegetables	04/06/2012...
Sprayer, kill crop	04/06/2012...
Sprayer, kill strips	09/18/2009...
Sprayer, post emergence	07/21/2009...
Sprayer, post emergence and fert. tank mix	04/13/2011...
Sprayer, pre-emergence	06/23/2006...

Sprayer Records

- First records mainly focused on applications that had “no effect”.
- Choices were limited.

The image displays two screenshots of a software interface for recording sprayer operations. The top window is titled "Operation: Sprayer, pre-emergence" and the bottom window is titled "Operation: Sprayer, insecticide post emergence". Both windows show a form with fields for speed, diesel use, and a sequence of processes.

Operation: Sprayer, pre-emergence

Rec. speed, mph	5.0
Min speed, mph	4.0
Max speed, mph	6.0

Base diesel use per area, gal/ac:

Info: Spray pre-emerge chemicals on bare soil. Crop is not killed. 033004 DTL

Sequence of processes

Sequence of Processes
Process: No effect

Operation STIR:

Add to this operation to make new one:

View/edit Operation Builder used to make this operation:

Operation: Sprayer, insecticide post emergence

Rec. speed, mph	5.0
Min speed, mph	4.0
Max speed, mph	6.0

Base diesel use per area, gal/ac:

Info: Spray pest control chemicals on growing crop. Crop is not killed. 11/17/01 DTL

Sequence of processes

Sequence of Processes
Process: No effect

Operation STIR:

Add to this operation to make new one:

View/edit Operation Builder used to make this operation:

Sprayer Records

- Newer records attempt to capture what happens with agrichemical application.

The image displays three overlapping screenshots of a software interface for recording sprayer operations. Each window shows fields for speed, diesel use, and a sequence of processes.

Operation: Sprayer, defoliant

Rec. speed, mph	5.0
Min speed, mph	4.0
Max speed, mph	6.0

Base diesel use per area, gal/ac: 0.13

Info: Sprayer, defoliant as used on cotton or other crops. Kills growing crop. Rev 043008
DTL removed flatten standing residue process. rev 040612 los

Sequence of processes

Sequence of Processes
Process: Kill veg.

Operation STIR: 0.15

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Sprayer, post emergence

Rec. speed, mph	5.0
Min speed, mph	4.0
Max speed, mph	6.0

Base diesel use per area, gal/ac: 0.13

Info: Spray pest control chemicals on growing crop. Crop is not killed. Residue type is set to weeds 3-6 months and 250 pounds but user can choose other residue type in the management screen. User must specify the amount of weed residue added in the "adjust external residue" box in the profile or worksheet screen when making the soil loss run. 080404 DTL

Sequence of processes

Sequence of Processes
Process: Add other cover

Operation STIR: 0.15

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Sprayer, backpack, kill vegetation

Rec. speed, mph	1.0
Min speed, mph	1.0
Max speed, mph	1.0

Base diesel use per area, gal/ac: ...0000010

Info: Hand Sprayer for pesticides on limited resource operations
033111 DTL

Sequence of processes

Sequence of Processes
Process: Kill veg.

Operation STIR: 0.15

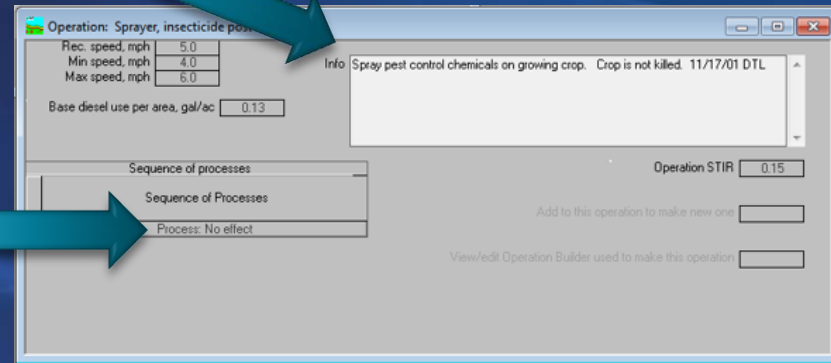
Add to this operation to make new one

View/edit Operation Builder used to make this operation

Sprayer Records

When selecting sprayer records:

- Read the Information box to ensure that the operation is correct for your situation
- Verify the correct process is present for your situation
- If you cannot find what you need, contact your State/Regional Agronomist for elevating your request to the RUSLE2 team.



The screenshot shows a software window titled "Operation: Sprayer, insecticide pos.". It contains several fields and a list:

Rec. speed, mph	5.0
Min speed, mph	4.0
Max speed, mph	6.0

Base diesel use per area, gal/ac: 0.13

Info: Spray pest control chemicals on growing crop. Crop is not killed. 11/17/01 DTL

Sequence of processes:

- Sequence of Processes
- Process: No effect

Operation STIR: 0.15

Add to this operation to make new one: [button]

View/edit Operation Builder used to make this operation: [button]

Two blue arrows point from the text in the list to the "Info" box and the "Sequence of processes" list.



Manure Records

- Most records were created or revised in 2008.

Manure injector, liquid high disturb.30 inch	09/18/2009...
Manure injector, liquid low disturb.15 inch	09/18/2009...
Manure injector, liquid low disturb.30 inch	09/18/2009...
Manure injector, low disturb.15 inch	04/10/2012...
Manure injector, low disturb.30 inch	04/10/2012...
Manure spreader, liquid	09/18/2009...
Manure spreader, slurry	09/18/2009...
Manure spreader, solid and semi-solid	09/18/2009...
Manure, liquid irrigation	09/18/2009...

Manure Records

- Records attempt to capture the effects of running manure application equipment through the field.

The screenshot displays three overlapping windows for manure application operations. Each window includes a title bar, a table of speeds, a diesel use input, an information text box, and a sequence of processes list.

Operation: Manure injector, liquid high disturb.30 inch

Rec. speed, mph	4.0
Min speed, mph	3.5
Max speed, mph	6.5

Base diesel use per area, gal/ac: 1.6

Info: Multiply the oven dry weight times an effectiveness factor of 0.5 to calculate the rate of application in model. Manure injector based on a deep ripper or chisel toolbar with manure injected behind and below the ripper shanks. Shanks spaced 30 inches apart or more. This represents the old style injector shank with significant disturbance. About 95% of material applied is incorporated into the soil. Rev 043008 DTL

Operation STIR: 7.8

Sequence of Processes:

- Process: Flatten standing res.
- Process: Disturb surface
- Process: Add other cover

Operation: Manure, liquid irrigation

Rec. speed, mph	5.0
Min speed, mph	4.0
Max speed, mph	6.0

Base diesel use per area, gal/ac: 0.35

Info: Multiply the oven dry weight times an effectiveness factor of 0.5 to calculate the rate of application in model. Spreading liquid manure via sprinkler irrigation. About 50% of material applied soaks into the soil through cracks and macropores. rev043008 DTL

Operation STIR: 0.15

Sequence of Processes:

- Process: Add other cover
- Process: Flatten standing res.

Operation: Manure spreader, liquid

Rec. speed, mph	4.0
Min speed, mph	3.0
Max speed, mph	8.0

Base diesel use per area, gal/ac: 1.2

Info: Multiply the oven dry weight times an effectiveness factor of 0.5 to calculate the rate of application in model. Spreading liquid manure. About 50% of material applied soaks into the soil through cracks and macropores. rev043008 DTL

Operation STIR: 0.29

Sequence of Processes:

- Process: Add other cover
- Process: Disturb surface
- Process: Flatten standing res.

Operation: Manure spreader, solid and semi-solid

Rec. speed, mph	4.0
Min speed, mph	3.0
Max speed, mph	8.0

Base diesel use per area, gal/ac: 1.2

Info: When spreading semisolid manure, multiply the oven dry weight times an effectiveness factor of 0.5 to calculate the rate of application in model. Manure spreader used to apply semi-solid or solid manure. All of material remains on the surface until incorporated by tillage. rev043008 DTL

Operation STIR: [blank]

Sequence of Processes:

- Process: Add other cover
- Process: Disturb surface
- Process: Flatten standing res.

Annotations:

- No "Disturb surface" process in this irrigation record**: Points to the "Process: Add other cover" step in the "Manure, liquid irrigation" record.
- "Disturb surface" process present in these records**: Points to the "Process: Disturb surface" steps in the "Manure spreader, liquid" and "Manure spreader, solid and semi-solid" records.

Manure Records

- Disturb Surface process for a manure spreader?

Operation: Manure spreader, liquid

Rec. speed, mph	4.0
Min speed, mph	3.0
Max speed, mph	8.0

Base diesel use per area, gal/ac

Info: Multiply the oven dry weight times an effectiveness factor of 0.5 to calculate the rate of application in model. Spreading liquid manure. About 50% of material applied soaks into the soil through cracks and macropores. rev043008 DTL

Sequence of processes

Process: Add other cover
Process: Disturb surface
Process: Flatten standing res.

Operation STIR

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Click on the folder

You get this window

Operation: Process: Disturb surface of Manure spreader, liquid

Tillage type	Compression
Tillage intensity, fraction	0.10
Rec. till. depth, in.	1.5
Min till depth, in.	1.0
Max till depth, in.	2.0
Ridge height, in.	0.10
Initial roughness, in.	0.24
Final roughness, in.	0.24
Surf. area disturbed, %	20

Apply Apply/Close Cancel

Residue burial ratios (by mass)		
Residue type	Burial ratio, fraction	Resurfacing, fraction
fragile-very small (soybeans)	0.070	0.010
mod. tough-short (wheat)	0.050	0.010
non-fragile-med. (corn)	0.040	0.010
woody-large	0.020	0.010
gravel-rock	0.040	0.010

Manure Records

Manure spreader, liquid

Operation: Process: Disturb surface of Manure spreader, liquid

Tillage type	Compression
Tillage intensity, fraction	0.10
Rec. till. depth, in.	1.5
Min till depth, in.	1.0
Max till depth, in.	2.0
Ridge height, in.	0.10
Initial roughness, in.	0.24
Final roughness, in.	0.24
Surf. area disturbed, %	20

Apply Apply/Close Cancel

Residue burial ratios (by mass)		
Residue type	Burial ratio, fraction	Resurfacing, fraction
fragile-very small (soybeans)	0.070	0.010
mod. tough-short (wheat)	0.050	0.010
non-fragile-med. (corn)	0.040	0.010
woody-large	0.020	0.010
gravel-rock	0.040	0.010

Manure injector, liquid high disturb.30 inch

Operation: Process: Disturb surface of Manure injector, liquid high disturb.30 inch

Tillage type	Lifting, fracturing
Tillage intensity, fraction	0.80
Rec. till. depth, in.	6.0
Min till depth, in.	4.0
Max till depth, in.	10
Ridge height, in.	4.0
Initial roughness, in.	1.5
Final roughness, in.	0.24
Surf. area disturbed, %	50

Apply Apply/Close Cancel

Residue burial ratios (by mass)		
Residue type	Burial ratio, fraction	Resurfacing, fraction
fragile-very small (soybeans)	0.38	0.050
mod. tough-short (wheat)	0.34	0.050
non-fragile-med. (corn)	0.29	0.050
woody-large	0.22	0.10
gravel-rock	0.43	0.050

Manure Records

When selecting manure records:

- Read the Information box
- Verify that the correct process(es) is/are present
- Check the disturb surface process(es) to ensure applicability for your situation
- If you cannot find what you need, contact your State/Regional Agronomist for elevating your request to the RUSLE2 team.

Operation: Manure spread

Rec. speed, mph	4.0
Min speed, mph	3.0
Max speed, mph	8.0

Base diesel use per area, gal/ac: 1.2

Sequence of Processes

Process: Add other cover	<input type="checkbox"/>
Process: Disturb surface	<input type="checkbox"/>
Process: Flatten standing res.	<input type="checkbox"/>

Info: Multiply the oven dry weight times an effectiveness factor of 0.5 to calculate the rate of application in model. Spreading liquid manure. About 50% of material applied soaks into the soil through cracks and macropores. rev043008 DTL

Operation STIR: 0.29

Add to this operation to make new one:

View/edit Operation Builder used to make this operation:



Fertilizer Records

- Many records were created or revised throughout the years as requests come into the RUSLE2 team.

Fert applic. anhyd knife 12 in	06/23/2006 ...
Fert applic. anhyd knife 12 in, coil tine har	09/22/2011 ...
Fert applic. broadcast by hand	04/30/2014 ...
Fert applic. coulter, high press. inject 12 in	06/23/2006 ...
Fert applic. deep plcmt hvy shnk	06/23/2006 ...
Fert applic. shank low disturbance, 12 in	06/23/2006 ...
Fert applic. shank low disturbance, 12 in, coil tine har	09/22/2011 ...
Fert applic. shank low disturbance, 15 in spacing	12/21/2006 ...
Fert applic. side-dress, liquid	04/13/2011 ...
Fert applic. surface broadcast	04/30/2014 ...
Fert applic., aerial	04/30/2014 ...
Fert. applic. anhyd knife 15 in spacing	12/21/2006 ...
Fert. applic. anhyd knife 15 in spacing high disturbance	11/23/2007 ...
Fert. applic. anhyd knife 15 in spacing high disturbance...	09/22/2011 ...
Fert. applic. anhyd knife 15 in spacing, coil tine har	09/20/2011 ...
Fert. applic. anhyd knife 30 in	06/23/2006 ...
Fert. applic. anhyd knife 30 in, bedded	04/01/2010 ...
Fert. applic. anhyd, liq, dry, minimal dist. precision placm...	03/15/2012 ...
Fert. applic. anhyd, low dist. single disk opener, 30 in	02/15/2012 ...
Fert. applic. double shot knife 15 in spacing high disturb...	11/23/2007 ...
Fert. applic. shallow anhyd knife 38 in	11/22/2011 ...
Fert. applic. single disk opener, low disturbance, 30 inc...	02/15/2012 ...
Fert. applic. sugarcane	12/08/2006 ...
Fert. applic., strip-till 30 in	06/23/2006 ...

Fertilizer Records

- Records attempt to capture the effects of running fertilizer equipment through the field.

Older records typically have less information

Newer records typically have more details in the information box

Operation: Fert. applic. deep plcmnt hvy shnk

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info 6/7/01 DTL

Base diesel use per area, gal/ac 0.90

Sequence of processes

Sequence of Processes

Process: Flatten standing res.

Process: Disturb surface

Operation STIR 13

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Fert. applic. single disk opener, low disturbance, 30 inch spac

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info Fertilizer applicator, Single disk opener 30 inch spacing low disturbance Similar to John Deere 2510H 02152012 DTL

Base diesel use per area, gal/ac 0.80

Sequence of processes

Sequence of Processes

Process: Flatten standing res.

Process: Disturb surface

Operation STIR 2.0

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Fert. applic. anhyd knife 30 in

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info 6/7/01 DTL

Base diesel use per area, gal/ac 0.80

Sequence of processes

Sequence of Processes

Process: Flatten standing res.

Process: Disturb surface

Operation STIR 2.6

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Fert. applic. sugarcane

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info Fertilizer applicator, sugarcane. This applicator is similar to an anhydrous applicator except pairs of shanks are spaced 24 inches apart to run in the furrows between 48 inch wide sugarcane beds. 013106 DTL

Base diesel use per area, gal/ac 0.70

Sequence of processes

Sequence of Processes

Process: Flatten standing res.

Process: Disturb surface

Operation STIR 1.6

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Fertilizer Records

- Records attempt to capture the effects of running fertilizer equipment through the field.

“Disturb surface”
process present in
these records

No “Disturb surface”
process in these
records

Operation: Fert applic. anhyd knife 12 in

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info 6/7/01 DTL

Base diesel use per area, gal/ac 0.90

Operation STIR 6.5

Sequence of processes

Sequence of Processes

Process: Flatten standing res.

Process: Disturb surface

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Fert applic. broadcast by hand

Rec. speed, mph	0
Min speed, mph	0
Max speed, mph	0

Info Broadcast fertilizer by hand 033111 DTL revised STIR 04302014 LOS

Base diesel use per area, gal/ac 0.0000010

Operation STIR 0

Sequence of processes

Sequence of Processes

Process: No effect

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Notice the multiple
“Disturb surface”
processes here

Fertilizer Records

- As with the manure records, check the “Disturb Surface” process(es) to ensure applicability for your situation.

Operation: Fert. applic. anhyd knife 30 in

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info 6/7/01 DTL

Base diesel use per area, gal/ac 0.80

Sequence of processes

Sequence of Processes

Process: Flatten standing res.

Process: Disturb surface

Operation STIR 2.6

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Operation: Process: Disturb surface of Fert. applic. anhyd knife 30 in

Tillage type	Lifting, fracturing
Tillage intensity, fraction	0.60
Rec. till. depth, in.	4.0
Min till depth, in.	3.0
Max till depth, in.	6.0
Ridge height, in.	2.0
Initial roughness, in.	0.60
Final roughness, in.	0.24
Surf. area disturbed, %	20

Apply Apply/Close Cancel

Residue burial ratios (by mass)		
Residue type	Burial ratio, fraction	Resurfacing, fraction
fragile-very small (soybeans)	0.10	0.050
mod. tough-short (wheat)	0.080	0.050
non-fragile-med. (corn)	0.060	0.050
woody-large	0.052	0.070
gravel-rock	0.076	0.050

Click on the folder

You get this window

Fertilizer Records

- For records with multiple “Disturb Surface” processes State Agronomist can see which implements were used to create the record.

Operation: Fert applic. anhyd knife 12 in, coil tine har

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Base diesel use per area, gal/ac

Info Fert applic. anhyd knife 12 in, 6/7/01, with coiled tine harrow. 09/16/11 GGF

Sequence of processes

Sequence of Processes	
+	-
	Process: Flatten standing res.
	Process: Disturb surface
	Process: Kill veg.
	Process: Flatten standing res.
	Process: Disturb surface

Operation STIR

Add to this operation to make new one

View/edit Operation Builder used to make this operation

Click on
the
button

You get
this
windo
w

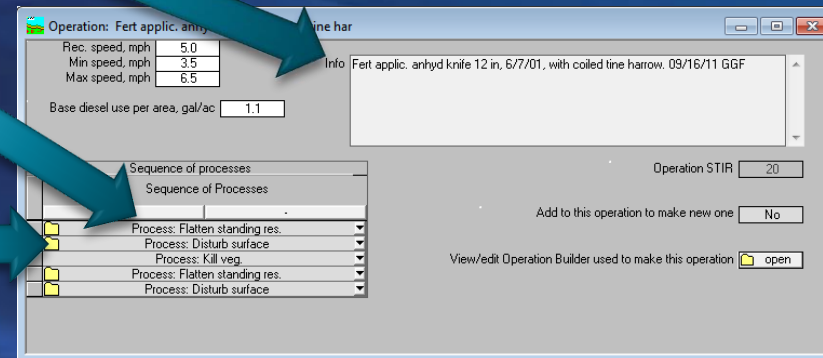
Operation: Operation builder of Fert applic. anhyd knife 12 in, coil tine har

Op. list	
Num.	Operation
1	Fert applic. anhyd knife 12 in
2	Harrow, coiled tine

Fertilizer Records

When selecting fertilizer records:

- Read the Information box
- Verify that the correct process(es) is/are present
- Check the disturb surface process(es) to ensure applicability for your situation
- If you cannot find what you need, contact your State/Regional Agronomist for elevating your request to the RUSLE2 team.



“Multi-Gang” Tillage Records

- Many records were created or revised throughout the years as requests come into the RUSLE2 team. These are just a few:

Seedbed conditioner, coil tine har, ring bskt	11/01/2007
Seedbed conditioner, coulter caddy, coil tine har	11/28/2007
Seedbed conditioner, coulter caddy, coil tine har, ring bskt	11/28/2007
Seedbed conditioner, coulter caddy, field cult, spike harrow	11/28/2007
Seedbed conditioner, coulter caddy, rtry har	11/28/2007
Seedbed conditioner, coulter caddy, rtry har, ring bskt	11/28/2007
Seedbed conditioner, coulter caddy, spk har	11/28/2007
Seedbed conditioner, coulter caddy, spk har, ring bskt	11/28/2007
Seedbed finisher	01/05/2012
Seedbed finisher, fld cult, chop, spk har, ring bskt	11/01/2007
Seedbed finisher, fld cult, coil tine har, rolling bskt	09/22/2011
Seedbed finisher, fld cult, mlch trdr	11/01/2007
Seedbed finisher, fld cult, rtry har	11/01/2007
Seedbed finisher, snl disk, fld cult, coil tine har, rolling bskt	07/02/2008
Seedbed finisher, snl disk, rotry har	07/02/2008
Seedbed finisher, snl dsk, fld cult, coil tine har	07/02/2008

“Multi-Gang” Tillage Records

- We’ve attempted to capture some of the diversity.



Subsoil disk ripper



Cultivator, field w/ spike points, coil tine har



Subsoil disk ripper, coulter
smooth, ring bskt

“Multi-Gang” Tillage Records

- However, not every combination of tillage tools are available.



“Multi-Gang” Tillage Records

- You can view the individual operations used to create the “multi-gang” tillage records as a State Agronomist and soon as a general user.

Operation: Disk, single gang

Rec. speed, mph	5.0
Min speed, mph	3.0
Max speed, mph	6.0

Info: Single disk gang 101706 DTL

Base diesel use per area, gal/ac: 0.38

Sequence of processes

Sequence of Processes

Process: Kill veg.

Process: Flatten standing res.

Process: Disturb surface

Add to this operation to make new one: No

View/edit Operation Builder used to make this operation: open

Operation STIR: 20

Operation: Cultivator, field 6-12 in sweeps

Rec. speed, mph	5.0
Min speed, mph	3.5
Max speed, mph	6.5

Info: 060701 DTL

Base diesel use per area, gal/ac: 0.74

Sequence of processes

Sequence of Processes

Process: Kill veg.

Process: Flatten standing res.

Process: Disturb surface

Add to this operation to make new one: No

View/edit Operation Builder used to make this operation: open

Operation STIR: 26

Operation: Harrow, coiled time

Rec. speed, mph	6.0
Min speed, mph	3.0
Max speed, mph	7.0

Info: 6/7/01 DTL

Base diesel use per area, gal/ac: 0.44

Sequence of processes

Sequence of Processes

Process: Kill veg.

Process: Flatten standing res.

Process: Disturb surface

Add to this operation to make new one: No

View/edit Operation Builder used to make this operation: open

Operation STIR: 16

Operation: Seedbed finisher, sngl dsk, fld cult, coil time har

Rec. speed, mph	4.0
Min speed, mph	3.0
Max speed, mph	8.0

Info: Seedbed finisher consisting of a single disk gang, field cultivator and coiled time harrow. "Combo mulch finisher" 103107 DTL

Base diesel use per area, gal/ac: 1.3

Sequence of processes

Sequence of Processes

Process: Kill veg.

Process: Flatten standing res.

Process: Disturb surface

Process: Kill veg.

Process: Flatten standing res.

Process: Disturb surface

Add to this operation to make new one: No

View/edit Operation Builder used to make this operation: open

Operation STIR: 36

Operation: Operation builder of Seedbed finisher, sngl dsk, fld cult, coil time har

Num.	Op. list
1	Disk, single gang
2	Cultivator, field 6-12 in sweeps
3	Harrow, coiled time

Apply Apply/Close Cancel

Click here

You get this window

"Multi-Gang" Tillage Records

- Again, you can see soil disturbance by clicking on any disturb surface folder.

The screenshot displays four windows for different tillage operations and one window for the operation builder. Each operation window includes fields for recording speed (mph), base diesel use (gal/ac), and a sequence of processes. The 'Disturb surface' process is highlighted in each window, and blue arrows point from these highlights to the 'Operation builder' window.

Operation: Disk, single gang
Rec. speed, mph: 5.0
Min speed, mph: 3.0
Max speed, mph: 6.0
Base diesel use per area, gal/ac: 0.38
Info: Single disk gang 101706 DTL
Operation STIR: 20
Sequence of processes:
Process: Kill veg.
Process: Flatten standing res.
Process: Disturb surface
Add to this operation to make new one: No
View/edit Operation Builder used to make this operation: open

Operation: Cultivator, field 6-12 in sweeps
Rec. speed, mph: 5.0
Min speed, mph: 3.5
Max speed, mph: 6.5
Base diesel use per area, gal/ac: 0.74
Info: 060701 DTL
Operation STIR: 26
Sequence of processes:
Process: Kill veg.
Process: Flatten standing res.
Process: Disturb surface
Add to this operation to make new one: No
View/edit Operation Builder used to make this operation: open

Operation: Harrow, coiled tine
Rec. speed, mph: 6.0
Min speed, mph: 3.0
Max speed, mph: 7.0
Base diesel use per area, gal/ac: 0.44
Info: 6/7/01 DTL
Operation STIR: 16
Sequence of processes:
Process: Kill veg.
Process: Flatten standing res.
Process: Disturb surface
Add to this operation to make new one: No
View/edit Operation Builder used to make this operation: open

Operation: Seedbed finisher, snlgl dsk, fld cult, coil tine har
Rec. speed, mph: 4.0
Min speed, mph: 3.0
Max speed, mph: 8.0
Base diesel use per area, gal/ac: 1.3
Info: Seedbed finisher consisting of a single disk gang, field cultivator and coiled tine harrow. "Combo mulch finisher" 103107 DTL
Operation STIR: 36
Sequence of processes:
Process: Kill veg.
Process: Flatten standing res.
Process: Disturb surface
Process: Kill veg.
Process: Flatten standing res.
Process: Disturb surface
Process: Kill veg.
Process: Flatten standing res.
Process: Disturb surface
Add to this operation to make new one: No
View/edit Operation Builder used to make this operation: open

Operation: Operation builder of Seedbed finisher, snlgl dsk, fld cult, coil tine har
Op. list

Num.	Operation
1	Disk, single gang
2	Cultivator, field 6-12 in sweeps
3	Harrow, coiled tine

Apply Apply/Close Cancel

“Multi-Gang” Tillage Records

- Comparing soil disturbance effect:

Operation: Process: Disturb surface of Disk, single gang

Tillage type	Mixing + some inversion
Tillage intensity, fraction	0.50
Rec. till. depth, in.	3.0
Min till depth, in.	2.0
Max till depth, in.	4.0
Ridge height, in.	1.0
Initial roughness, in.	0.60
Final roughness, in.	0.24
Surf. area disturbed, %	100

Operation: Process: Disturb surface of Seedbed finisher, snlgl dsk, fld cult, coil tine har

Tillage type	Mixing + some inversion
Tillage intensity, fraction	0.50
Rec. till. depth, in.	3.0
Min till depth, in.	2.0
Max till depth, in.	4.0
Ridge height, in.	1.0
Initial roughness, in.	0.60
Final roughness, in.	0.24
Surf. area disturbed, %	100

Operation: Process: Disturb surface of Cultivator, field 6-12 in sweeps

Tillage type	Mixing + some inversion
Tillage intensity, fraction	0.40
Rec. till. depth, in.	4.0
Min till depth, in.	2.0
Max till depth, in.	6.0
Ridge height, in.	2.0
Initial roughness, in.	0.60
Final roughness, in.	0.24
Surf. area disturbed, %	100

Operation: Process: Disturb surface of Seedbed finisher, snlgl dsk, fld cult, coil tine har

Tillage type	Mixing (only)
Tillage intensity, fraction	0.40
Rec. till. depth, in.	4.0
Min till depth, in.	2.0
Max till depth, in.	6.0
Ridge height, in.	2.0
Initial roughness, in.	0.60
Final roughness, in.	0.24
Surf. area disturbed, %	100

Operation: Process: Disturb surface of Harrow, coiled tine

Tillage type	Mixing + some inversion
Tillage intensity, fraction	0.25
Rec. till. depth, in.	2.0
Min till depth, in.	1.0
Max till depth, in.	3.0
Ridge height, in.	1.0
Initial roughness, in.	0.40
Final roughness, in.	0.24
Surf. area disturbed, %	100

Operation: Process: Disturb surface of Seedbed finisher, snlgl dsk, fld cult, coil tine har

Tillage type	Compression
Tillage intensity, fraction	0.25
Rec. till. depth, in.	2.0
Min till depth, in.	1.0
Max till depth, in.	3.0
Ridge height, in.	1.0
Initial roughness, in.	0.40
Final roughness, in.	0.24
Surf. area disturbed, %	100

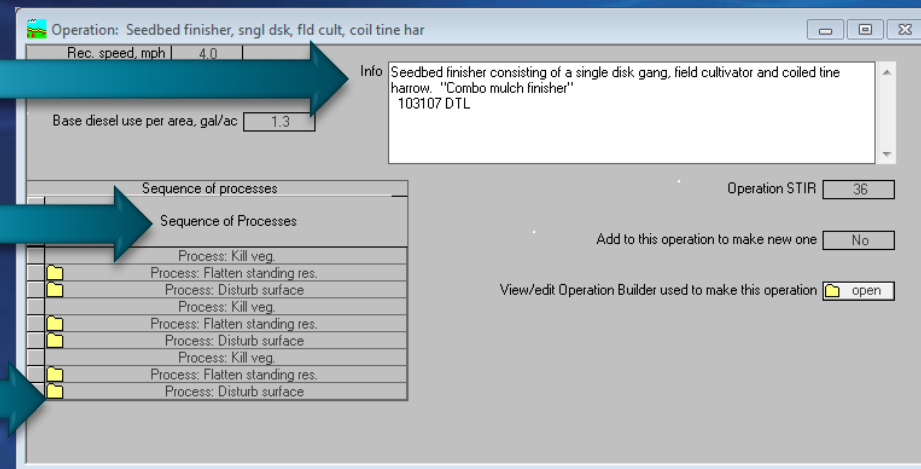
Apply Apply/Close Cancel

Apply Apply/Close Cancel

“Multi-Gang” Tillage Records

When selecting tillage records:

- Read the Information box
- Verify that the correct processes are present
- Check the disturb surface process(es) to ensure applicability for your situation
- If you cannot find what you need, contact your State/Regional Agronomist for elevating your request to the RUSLE2 team.



The screenshot shows the 'Operation: Seedbed finisher, sngl disk, fld cult, coil tine har' window. It includes fields for 'Rec. speed, mph' (4.0) and 'Base diesel use per area, gal/ac' (1.3). An 'Info' box on the right describes the operation as a 'Seedbed finisher consisting of a single disk gang, field cultivator and coiled tine harrow. "Combo mulch finisher" 103107 DTL'. A 'Sequence of processes' list on the left contains: Kill veg., Flatten standing res., Disturb surface, Kill veg., Flatten standing res., Disturb surface, Kill veg., Flatten standing res., and Disturb surface. On the right, there are controls for 'Operation STIR' (36), a button to 'Add to this operation to make new one' (No), and a 'View/edit Operation Builder used to make this operation' button (open).



What to do if you need a new
record immediately?

Improvise!

Example

Coulters used to close depressions left by subsoilers

Subsoilers

Coulters associated with the subsoilers

Rolling Baskets to smoothen the surface



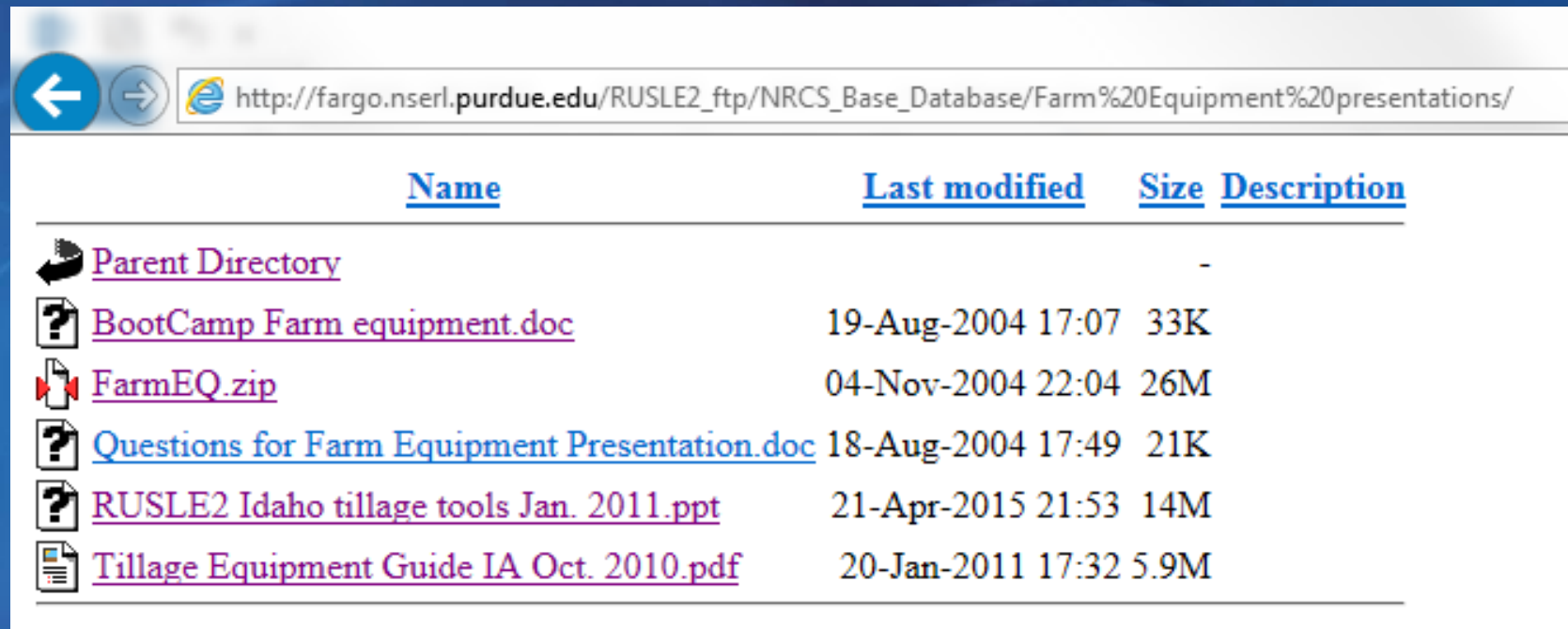
- May look something like this (STIR=22):

Date, m/d/y		End/Start crop year?		Operation	
+	-				
10/1/0	▼	No	📁	Subsoiler, in row	▼
10/1/0	▼	No	📁	Coulter caddy, with smooth coulters	▼
10/1/0	▼	No	📁	Rolling basket incorporator	▼







Resources

● Pictures of equipment at

http://fargo.nserl.purdue.edu/RUSLE2_ftp/NRCS_Base_Database/Farm%20Equipment%20presentations/



The screenshot shows a web browser window with the address bar displaying the URL: http://fargo.nserl.purdue.edu/RUSLE2_ftp/NRCS_Base_Database/Farm%20Equipment%20presentations/. Below the address bar is a table listing files and directories. The table has four columns: Name, Last modified, Size, and Description. The files listed are: Parent Directory, BootCamp Farm equipment.doc, FarmEQ.zip, Questions for Farm Equipment Presentation.doc, RUSLE2 Idaho tillage tools Jan. 2011.ppt, and Tillage Equipment Guide IA Oct. 2010.pdf.

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory		-	
 BootCamp Farm equipment.doc	19-Aug-2004 17:07	33K	
 FarmEQ.zip	04-Nov-2004 22:04	26M	
 Questions for Farm Equipment Presentation.doc	18-Aug-2004 17:49	21K	
 RUSLE2 Idaho tillage tools Jan. 2011.ppt	21-Apr-2015 21:53	14M	
 Tillage Equipment Guide IA Oct. 2010.pdf	20-Jan-2011 17:32	5.9M	

Finally

- Remember to always check soil disturbance between what is happening in the field and the RUSLE2 record that you have selected to ensure accuracy!

Questions?

