Guidance for Calculating Manure Dry Weight and Erosion Control Effectiveness in RUSLE2

When manure application is included as an operation on the field, the RUSLE2 Crop Management File will need to include the manure operation. When you select the manure operation in the RUSLE2 management screen, a dialog box will appear to the right of the operation that requires you to include the type of manure that you are applying. Use the dropdown list to select the correct type of manure.

-	😽 Management	: CMZ 04\c.Other Local Mgt Records\cor	n grain;	Fmanure high disturb,	Phoe	nix harr	ow, Soybean;wr,	NT z4*		
	Grap Hel. row grade	bhic Long-term na Normally used	tural rough I as a rotat Duratio	, in. 0.24 on? Yes 1. vr 2						
Ĩ	Build new rotation using this management Open									
I	Rotation builder for this management 🦳 open									
I										
	Operations Info									
1			Manag	ement Operations						
4	Date, m/d/y	Operation		Vegetation		rield (#	External residue	Surf. res.	er from	
d	+ -				ha	arv. unitsj	21101101101000			
1	11/15/1 🗾 🗋	Manure injector, liquid high disturb.30 inch	-			(🗋 Manure, liquid 🤰			
1	5/10/2 🗾 🗋	Harrow, heavy on heavy resdue	-							
1	5/10/2 🗾 🗋	Planter, double disk opnr w/fluted coulter	<u> </u>	Corn, grain	-	112				
I	10/20/2 🗾 🗋	Harvest, killing crop 50pct standing stubble	<u> </u>					5958.4	90	
I	5/15/3 🗾 🗋	Planter, double disk opnr w/fluted coulter		Soybean, mw 30 in rows	-	30.0				
I	10/10/3 🗾 🗋	Harvest, killing crop 50pct standing stubble	_					1026.0	45	
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You will then need to enter the amount of any additional "residue" cover on a dry weight basis in the RUSLE2 profile screen in **Step 4c: adjust management inputs if desired** in the box "**Adjust ext. res. additions**".

RUSLE2 Version 1.18.4.0 (Aug. 4 2004)	x 6 0 2 x 2 x				
File Database Edit View Options Window Help					
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🔁 Profile: Cass*					
STEP 1: Choose location to set climate: Location USANowa/Cass Lounty T					
Soil Choose soil type: Soil CLAY LOAM, 5 TO 9 PERCENT SLOPES, MODERATELY ERODE	ED\MARSHALL silty clay loam 100% 🗾				
STEP 3: Set slope topography: Slope length (along slop 200 Avg. slope steepness, % 7.0					
STEP 4a: Select base management 🕒 CMZ 04\c. Other Local Mgt Records\corn grain;Fmanure high disturb, Phoenix harrow, Soybean;wr, NT z4* 💌					
STEP 4b: Modify/build man. sequence if desired:					
Management sequence Starting Ending Correct	General yield level Set by user				
+ - Management date, m/d/y date, m/d/y dates by:	Adjust res, burial level Normal res, burial				
1 \com grain.Fmanure high disturb, Phoenix harrow, Soybean.wr, NT z4* 🗙 11/15/1 💌 10/10/3 👻 🚥 🖉 Adjust ext. res. additions 🗋 Residue inputs					
Profile: Residue inputs (Adjust ext. res. additions(11) of Cass*					
Residue addition values	s				
Date Operation Re	esidue type added, addition %				
11/15/1 injector, liquid high disturb.30 inch 🎦 M	Ib/ac fanure, liquid 10				
STEP 5. Set averaging eventions					
Contouring Contouring b. absolute ro					
Strips/barriers					
Diversion/terrace, sediment basin					
Subsurface drainage (none)					
Results Additional Results					
Soil loss for cons. plan, t/ac/yr 5.1 Info	<u>A</u>				
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If you have a manure test that shows percent moisture content, that is ideal; manure solids make up the remainder of the material. You may also use moisture content estimates in the Ag Waste Handbook for various manure classes. Using any of these values of moisture content requires a side calculation to get to dry matter amount. Liquid manure with 90% moisture content would have 10% dry matter (10% of the weight of the manure). A ten-ton actual application rate would then apply 1 ton of dry matter (2000 pounds).

In addition, new RUSLE2 manure residue effectiveness guidelines for the liquid, slurry, semi-solid and poultry manure types state that only 50% of the dry weight for these wet manure types should be entered into the model. We are assuming that the dry matter in these manure types is less effective in retarding erosion processes. In this example you would enter only 1000 lbs. (2000 lbs. x 0.5 = 1000 lbs.). These guidelines are in the notes or information boxes on these manure types as well as in the manure application operations in the database shipped with the current version of the model. This 50% effectiveness factor does not apply to solid manure with bedding.

The summary table below shows the acceptable effective residue values to be multiplied by the total amount of manure applied per acre to calculate the total residue values to be entered into the RUSLE2 calculations for applying manure.

Livest	ock Manure Type %	Moisture Content	%Solids	Effective Residue	
Dairy					
-	Milk House	99.72%	0.28%	0.14%	
	Milk House + Parlor	99.40%	0.60%	0.30%	
	Milk House + Parlor + Holding	area 99.70%	0.30%	0.15%	
	Anaerobic lagoon – Sludge	90.00%	1.00%	0.50%	
	Anaerobic lagoon – Supernatan	t 99.75%	0.25%	0.125%	
	Aerobic lagoon – Supernatant	99.95%	0.05%	0.025%	
Beef					
	Unsurfaced lot	45.0%	55.00%	55.00%	
	Surfaced lot - High forage	53.3%	46.70%	46.70%	
	Surfaced lot – High energy	52.1%	47.90%	47.90%	
	Feedlot runoff pond – Sludge	82.8%	17.20%	8.60%	
	Feedlot runoff pond – Supernata	ant 99.7%	0.30%	0.15%	
Swine					
	Storage tank under slats				
	Farrow	96.50%	3.50%	1.75%	
	Nursery	96.00%	4.00%	2.00%	
	Grow/Finish	91.00%	9.00%	4.50%	
	Breeding/gestation	97.00%	3.00%	1.50%	

Summary - Effective Residue Value of Manure from Ag Waste Handbook

%Solids **Effective Residue Livestock Manure Type** % Moisture Content 99.75% Anaerobic lagoon – Supernatant 0.25% 0.125% Anaerobic lagoon – Sludge 92.40% 7.60% 3.80% Feedlot runoff water 98.50% 1.50% 0.75% Feedlot settling basin sludge 88.80% 11.20% 5.60% Poultry Litter Layer high-rise 50.00% 50.00% 50.00% Broiler 24.00% 76.00% 76.00% Turkey 34.00% 66.00% 66.00% Broiler breeder 34.00% 66.00% 66.00% Duck 11.20% 88.80% 88.80% Anaerobic lagoon Layer - Supernatant 99.50% 0.50% 0.25% Layer – Sludge 86.90% 13.10% 6.55% Pullet – Supernatant 99.70% 0.30% 0.15% Pullet – Sludge 92.60% Veal As Excreted 97.50% 2.50% 1.25% Sheep As Excreted 75.00% 25.00% 25.00% Horse As Excreted 78.00% 22.00% 22.00%

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