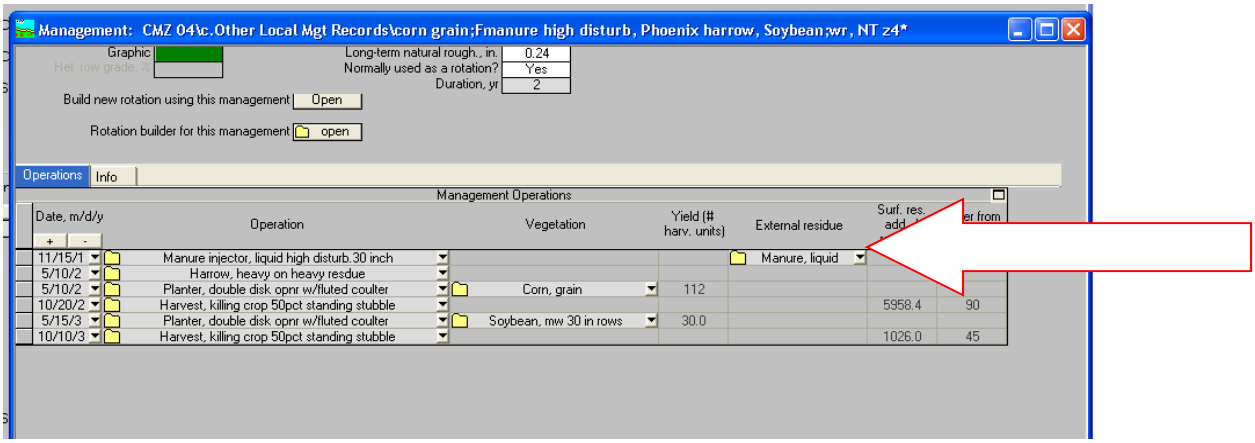
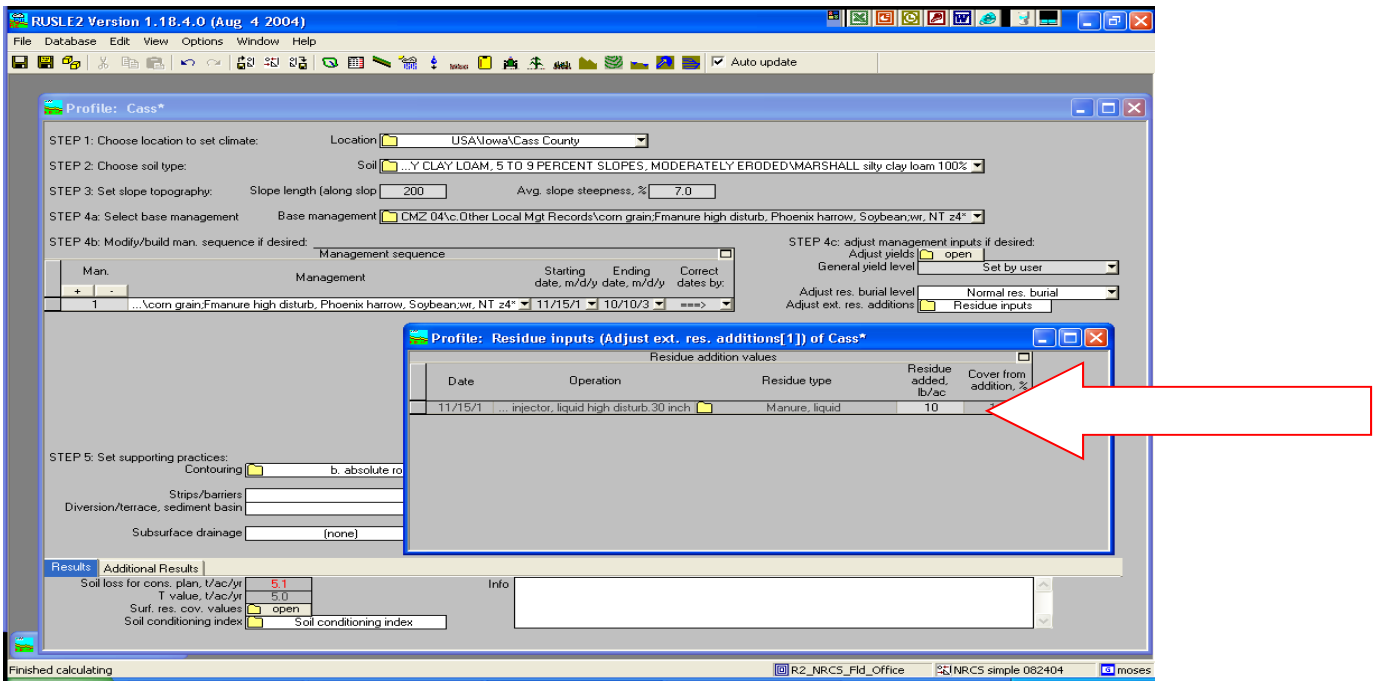
Guidance for Calculating Manure Dry Weight and Erosion Control Effectiveness in RUSLE2

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 drop-down list to select the correct type of manure.



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**".



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.

Summary - Effective Residue Value of Manure from Ag Waste Handbook

Livestock 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 – Supernatant	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 – Supernatant	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%

Livestock Manure Type	% Moisture Content	%Solids	Effective Residue
Anaerobic lagoon – Supernatant	99.75%	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%