

Example 1—Broiler Farm

- The farm consists of 205 acres.
- Two broiler houses will raise 6 flocks per year.
- Each flock will consist of 25,000 birds.
- Average weight per bird will be 3 lbs.
- Days in confinement = 48 days.
- Within one year there will be a total of 11 weeks where there are no birds. This occurs between shipping and receiving new flocks.
- The producer plans to use an adjacent farm, not owned, to apply the litter.
- Soil Test Phosphorus is 200 lbs.
- There will be no cake removal.
- Barns will be cleaned out once per year in spring.
- Mortalities will be composted.
- Assume the producer will raise 200 bushels of corn per acre.
 - Assume they will surface apply and not incorporate.
 - How many acres will they need if they use an N-based rate?
 - How many acres will they need if they use a P-based rate?

SOLIDS WORKSHEET 1 - ESTIMATING NUTRIENTS GENERATED PER CONFINEMENT PERIOD									
1. Nutrients Generated (As Excreted)									
Animal Type	Number of Animals	Percent Waste as Solid ^a	Average Weight (lbs.)	1000	Time Between Clean Outs/Land Applications ^b (Confinement)	Animal Unit Days	N	P ₂ O ₅	K ₂ O
Table 1		x	x	/	x	=			
Poultry Litter Broiler	300,000	x 100%	x 3.0	/ 1000	x 48	= 43,200	N 0.96 = 41,472	P ₂ O ₅ 0.64 = 27,648	K ₂ O 0.65 = 28,080
		x	x	/	x	= 0	N		
		x	x	/	x	= 0	P ₂ O ₅		
		x	x	/	x	= 0	K ₂ O		
Step 1 Total =							41,472	27,648	28,080
(lbs.)									
2. Manure Generated (As Excreted)									
Animal Unit Days	x	Manure/A.U.	=	Volume of Manure (cu.ft.)					
43,200	x	1.4	=	60,480					
	x		=						
	x		=						
Step 2 Total =							60,480	cu.ft.	
3. Total Tons									
Step 2	/	Conversion Factor	=	Total Tons					
60,480	/	74	=	817					
	/		=						
	/		=						
Step 3 Total =							817	tons	
4. Weighted Nutrient Values Before Nutrient Losses									
Step 4 Total =							50.7	33.8	34.4
(lbs./ton)									
^a The percent of the manure that is handled as a solid.									
^b Confinement period should be adjusted for animals that are only in confinement for a portion of the day. For example if animals spend 16 hours on pasture and 8 hours in confinement, then the confinement period would be 1/3 of a day or 122 days/year.									

Step 1) there are two houses that raise six flocks per year, each flock has 25,000 birds. 2 (houses) X 6 (flocks) =12 flocks.
 12 (flocks) x 25,000 (birds per flock) = 300,000 birds per year. When determining the amount of manure each flock had a cycle of 48 days.

Another way to look at it

Step 1) there are two houses that hold 25,000 birds each (50,000 total). There are six cycles that last 48 days each. 6 (cycles) x 48 (days) = 288 days.

Either way you enter step 1, it will come to 817 tons.

SOLIDS WORKSHEET 2 - NUTRIENT BALANCE

Tract Field No. Acres

Soil Test P Value (Mehlich 3)

1. Crop or Crop Sequence/Rotation	<input type="text" value="Corn Grain (Bushel)"/>		
2. Realistic Yield (Average from 5-10 Years on a per acre basis)	<input type="text" value="200.0"/>		
3. Plant Nutrients Needed or Allowed (lbs/ac)	N	P₂O₅	K₂O
	180	80	70
4. Adjusted P ₂ O ₅ Application Rate According to Threshold	<input type="text" value="0"/>		
5. Fertilizer Credits (lbs/ac)	<input type="text"/>		
6. Plant Nutrients Needed Minus Credits (lbs/ac)	180	80	70
7. Nutrients in Manure (lbs/ton) Enter lab results in box on right to override Worksheet 1 values	50.7	33.8	34.4
8. Percent Nutrients Retained in System <input type="text" value="Table 1"/> Enter Table 1 values or Enter zero if lab results are used in Step 7	70%	95%	95%
9. Net Retained Nutrients in Manure (lbs./ton)	35.5	32.1	32.6
10. Percent of Available Nutrients Enter Table 2 value for N <input type="text" value="Table 2"/>	45%	80%	100%
11. Net Available Nutrients (lbs./ton)	16.0	25.7	32.6
12. Application Rate (tons/ac) Application limitations may apply. Enter Chosen Application Rate in box on right	4	4	4
13. Net Application Amount for All Nutrients (lbs/ac)	64	103	131
14. Nutrient Needs (-) or Surpluses (+) (lbs/ac)	-116	23	61

Tons Available - Tons Applied in Field = Balance

Enter Lab Results Here to Override Calculations From Worksheet 1 on Step 7

N	P205	K20
<input type="text"/>	<input type="text"/>	<input type="text"/>

Chosen Application Rate MUST ENTER

Go to Worksheet 3 Solids

Remember this is just a tool, farmers cannot apply manure to a decimal point. So when determining the application rate use whole numbers. By using this application rate of 4 tons to the acres we are over applying on Phosphorous, which is fine but not the best utilization of the manure.

SOLIDS WORKSHEET 3 - APPLICATION RATES AND LAND REQUIREMENTS ¹

Tract No.										
Field No.	Acres	Soil Test Phosphorus (STP)	Crop Rotation / Sequence	Planned Application Date or Timing	Planned Application Rate ² (tons/ac)	Solid or Commercial Fertilizer (S or C)	Actual Application Date	Actual Application Rate ² (tons/ac)	Weather at Time of Application ³ (Cloudy, Raining, Sunny)	
									24 Hours Before	24 Hours After
									0	205
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					
0	0	0	0		0					

1. Where land application is occurring under long term lease or agreement with adjacent landowner, fields must be included in the above table.
 2. Fields that have a "High" soil test phosphorus (>400) should implement Best Management Practices (BMPs) to reduce the risk of nutrient movement to sensitive waterbodies. BMPs may include, but not be limited to: installing conservation buffers, reducing P2O5 application rate, incorporating manure, adding chemical treatments to litter that tie up soluble P and keep it from moving over the landscape, and/or adjusting application timing.
 3. It is illegal to make land applications when the ground is frozen. It is recommended that land applications are not made within 48 hours of forecasted precipitation.