

Manure Applicator Calibration Guide

- 1. Spreader Capacity is Known.** From chart below, select 1) Spreader Capacity: _____ lbs. or gallons; 2) Distance traveled (length) to empty spreader: _____ feet; and 3) Spread pattern width or distance between individual passes: _____ feet. 4) Intersection indicates application rate: _____

If appropriate values cannot be found in table below, calculate application rate as follows: Rate per acre = Spreader Capacity X 43560 (Width X Length).

Example: 3000 gallon tank spreader that makes a pass every 4 30"-corn rows (10 feet) and empties spreader in 1200 feet is applying 11,000 gallons per acre.

Spread Width-->	2000 gallon tank :						2500 gallon tank :						3000 gallon tank :						3500 gallon tank :						4000 gallon tank :						4500 gallon tank :					
	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'
Length	Liquid manure application rate (1000's of gallons per acre)																																			
600'	15	10	7	6	5	4	18	12	9	7	6	5	22	15	11	7	5	4	25	17	13	8	6	5	29	19	15	10	7	6	33	22	16	11	8	7
800'	11	7	5	4	4	3	14	9	7	5	5	4	16	11	8	5	4	3	19	13	10	6	5	4	22	15	11	7	5	4	25	16	12	8	6	5
1000'	9	6	4	3	3	2	11	7	5	4	4	3	13	9	7	4	3	3	15	10	8	5	4	3	17	12	9	6	4	3	20	13	10	7	5	4
1200'	7	5	4	3	2	2	9	6	5	4	3	3	11	7	5	4	3	2	13	8	6	4	3	3	15	10	7	5	4	3	16	11	8	5	4	3
1400'	6	4	3	2	2	2	8	5	4	3	3	2	9	6	5	3	2	2	11	7	5	4	3	2	12	8	6	4	3	2	14	9	7	5	4	3
1600'	5	4	3	2	2	2	7	5	3	3	2	2	8	5	4	3	2	2	10	6	5	3	2	2	11	7	5	4	3	2	12	8	6	4	3	2
1800'	5	3	2	2	2	1	6	4	3	2	2	2	7	5	4	2	2	1	8	6	4	3	2	2	10	6	5	3	2	2	11	7	5	4	3	2
2000'	4	3	2	2	1	1	5	4	3	2	2	2	7	4	3	2	2	1	8	5	4	3	2	2	9	6	4	3	2	2	10	7	5	3	2	2
2500'	3	2	2	1	1	1	4	3	2	2	1	1	5	3	3	2	1	1	6	4	3	2	2	1	7	5	3	2	2	1	8	5	4	3	2	2
3000'	3	2	1	1	1	1	4	2	2	1	1	1	4	3	2	1	1	1	5	3	3	2	1	1	6	4	3	2	1	1	7	4	3	2	2	1

Slurry or Liquid Manure

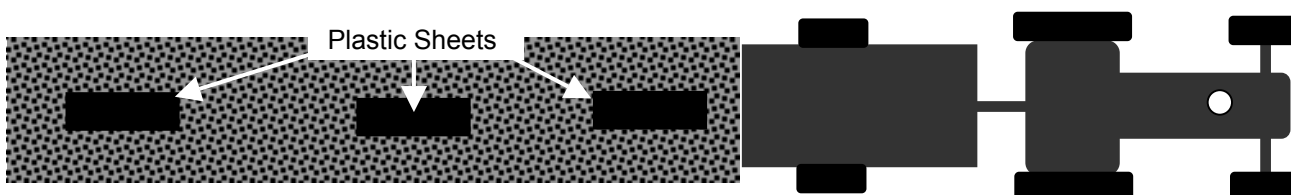
Spread Width-->	5000 gallon tank :						5500 gallon tank :						6000 gallon tank :						3 ton spreader (90 bushel)						4 ton spreader (120 bushel)						6 ton spreader (175 bushel)						
	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	30'	40'	50'	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	
Length	Liquid manure application rate (1000's of gallons per acre)																		Solid manure application rate (tons per acre)																		
600'	36	24	18	12	9	7	40	27	20	13	10	8	44	29	22	15	11	9	22	15	11	9	7	6	29	19	15	12	10	8	44	29	22	17	15	12	
800'	27	18	14	9	7	5	30	20	15	10	7	6	33	22	16	11	8	7	16	11	8	7	5	5	22	15	11	9	7	6	33	22	16	13	11	9	
1000'	22	15	11	7	5	4	24	16	12	8	6	5	26	17	13	9	7	5	13	9	7	5	4	4	17	12	9	7	6	5	26	17	13	10	9	7	
1200'	18	12	9	6	5	4	20	13	10	7	5	4	22	15	11	7	5	4	11	7	5	4	4	3	15	10	7	6	5	4	22	15	11	9	7	6	
1400'	16	10	8	5	4	3	17	11	9	6	4	3	19	12	9	6	5	4	9	6	5	4	3	3	12	8	6	5	4	4	19	12	9	7	6	5	
1600'	14	9	7	5	3	3	15	10	7	5	4	3	16	11	8	5	4	3	8	5	4	3	3	2	11	7	5	4	4	3	16	11	8	7	5	5	
1800'	12	8	6	4	3	2	13	9	7	4	3	3	15	10	7	5	4	3	7	5	4	3	2	2	10	6	5	4	3	3	15	10	7	6	5	4	
2000'	11	7	5	4	3	2	12	8	6	4	3	2	13	9	7	4	3	3	7	4	3	3	2	2	9	6	4	3	3	2	13	9	7	5	4	4	
2500'	9	6	4	3	2	2	10	6	5	3	2	2	10	7	5	3	3	2	5	3	3	2	2	1	7	5	3	3	3	2	2	10	7	5	4	3	3
3000'	7	5	4	2	2	1	8	5	4	3	2	2	9	6	4	3	2	2	4	3	2	2	1	1	6	4	3	2	2	2	9	6	4	3	3	2	

Solid Manure

Spread Width-->	8 ton spreader (230 bushel)						10 ton spreader (290 bushel)						12 ton spreader (350 bushel)						14 ton spreader (410 bushel)						16 ton spreader (470 bushel)						18 ton spreader (530 bushel)					
	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'	10'	15'	20'	25'	30'	35'
Length	<i>Solid manure application rate (tons per acre)</i>																																			
600'	58	39	29	23	19	17	73	48	36	29	24	21	87	58	44	35	29	25	102	68	51	41	34	29	116	77	58	46	39	33	131	87	65	52	44	37
800'	44	29	22	17	15	12	54	36	27	22	18	16	65	44	33	26	22	19	76	51	38	30	25	22	87	58	44	35	29	25	98	65	49	39	33	28
1000'	35	23	17	14	12	10	44	29	22	17	15	12	52	35	26	21	17	15	61	41	30	24	20	17	70	46	35	28	23	20	78	52	39	31	26	22
1200'	29	19	15	12	10	8	36	24	18	15	12	10	44	29	22	17	15	12	51	34	25	20	17	15	58	39	29	23	19	17	65	44	33	26	22	19
1400'	25	17	12	10	8	7	31	21	16	12	10	9	37	25	19	15	12	11	44	29	22	17	15	12	50	33	25	20	17	14	56	37	28	22	19	16
1600'	22	15	11	9	7	6	27	18	14	11	9	8	33	22	16	13	11	9	38	25	19	15	13	11	44	29	22	17	15	12	49	33	25	20	16	14
1800'	19	13	10	8	6	6	24	16	12	10	8	7	29	19	15	12	10	8	34	23	17	14	11	10	39	26	19	15	13	11	44	29	22	17	15	12
2000'	17	12	9	7	6	5	22	15	11	9	7	6	26	17	13	10	9	7	30	20	15	12	10	9	35	23	17	14	12	10	39	26	20	16	13	11
2500'	14	9	7	6	5	4	17	12	9	7	6	5	21	14	10	8	7	6	24	16	12	10	8	7	28	19	14	11	9	8	31	21	16	13	10	9
3000'	12	8	6	5	4	3	15	10	7	6	5	4	17	12	9	7	6	5	20	14	10	8	7	6	23	15	12	9	8	7	26	17	13	10	9	7

2. Spreader Capacity is Unknown.

- Cut three or more sheets of equally sized plastic. 22 square feet (3' x 7'4" or 4' X 5'6") is preferred size.
- Weigh empty 5 gallon bucket plus one plastic sheet on a scale: _____ lbs.
- Lay sheets in field with edges secured by stones or other heavy objects.
- Drive tractor at normal speeds and discharge manure at typical rates over plastic sheets. Record tractor gear: _____, engine RPM: _____, and spreader settings: _____



- Check the sheet. Did a reasonably representative application rate fall on the plastic sheet?
- Carefully fold individual sheets without losing manure and place each sheet in separate buckets. Weigh each bucket. Bucket 1: _____ lbs. Bucket 2: _____ lbs. Bucket 3: _____ lbs.
- Subtract weight of empty bucket and plastic (step b) to determine net manure weight in each bucket. Net manure weight for Bucket 1: _____ lbs. Bucket 2: _____ lbs. Bucket 3: _____ lbs.
- Calculate average weight of buckets. Average Net Manure Weight: _____ lbs.
- Calculate application rate. Tons per Acre = (Net Manure Weight X 22) / area of plastic sheet (ft²)
If plastic sheet = 22 ft², then: Tons per Acre = Net Manure Weight

3. Pivot Calibration

If Pivot Flow Rate Is Known:

- Estimate pumping time: _____ hours
- Estimate water flow rate: _____ gallons per minute
- Estimate acres covered: _____ acres
- Estimate application rate:

$$\begin{array}{l} \text{Inches} \\ \text{(or ac-in/ac)} \end{array} = \frac{\text{Pumping Time X Flow Rate}}{\text{Acres X 450}} = \frac{\text{X}}{\text{X 450}} = \text{_____ in.}$$

If Pivot Flow Rate Is NOT Known:

- Place 4 to 6 rain gauges (pans or straight sided plastic cups will also work) in line with the pivot center point at roughly equally spaced intervals. Placement on access road away from crop canopy is preferred.
- Measure depth in rain gauges and calculate average.

Gauge #1: _____ in. #2: _____ in. #3: _____ in. #4: _____ in. #5: _____ in. #6: _____ in.
 Average Depth: _____ inches

OR

- Identify Rated Pump Pressure and Flow Rate: _____ psi at _____ gpm
- Identify Actual Pump Pressure: _____ psi
- Estimate Actual Flow Rate.

$$\text{GPM}_{\text{actual}} = \text{GPM}_{\text{rated}} \times \sqrt{\frac{\text{P}_{\text{actual}}}{\text{P}_{\text{rated}}}} = \text{_____} \times \sqrt{\frac{\text{_____}}{\text{_____}}} = \text{_____ gpm}$$

- Substitute actual flow rate in part d for "If Flow Rate Is Known" and complete calculation of application rate.

* Square Root

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