



# Animal Waste Management

TECHNICAL NOTE #4

## Manure Spreader Calibration Worksheet

Calibrating your manure spreader is a valuable management tool that can help you better use the nutrients available in manure. By knowing how much the spreader is applying you can apply manure at a rate that can meet crop nutrient needs. Using manure as a nutrient source for crops will help save money on your fertilizer bill.

### How Much Do I Need To Apply?

Calibrate the spreader to deliver a rate based on crop needs and soil test recommendations. It is equally important to know the amount of nutrients in the manure you will be spreading. Manure analysis tests will provide this information. Both testing kits and information on how to test are available at your county Extension Office.

After you know the quantity of nutrients in the manure and the soil test recommendation, the manure application rate can be determined based on crop needs. Over application of nutrients doesn't improve crop yields, but it can cause ground water contamination from nitrates and coliform bacteria.

Two methods for spreader calibration follow. Method 1 is best for solid or semi-solid (dense liquid) manure. Method 2 is best with liquid spreaders.

### Manure Spreader Calibration Worksheet Method 1 - For Solid or Semi-Solid Manure

#### Items Needed

- Plastic sheet (6' x 6' or 10' x 10' is good, but any size would do)
- Scale (milk or bathroom scale is good)
- Bucket

#### How To Do It

1. Weigh sheet with bucket on scale.
2. Lay sheet in field where manure will be spread. Place sheet far enough in the field to give you enough distance to put spreader in gear and get tractor up to speed. Also, most spreaders apply less at the beginning and end of the load.

3. Drive tractor and spreader directly over the sheet.
4. Fold sheet so no manure is spilled. Put sheet in bucket and weigh on scale.
5. Subtract weight of the empty bucket and sheet in Step 1 from the weight of the sheet and bucket filled with manure. This number is the weight of manure caught on the sheet.
6. Repeat the procedure and determine an average for the two weights.
7. Check the spreader calibration chart (Table 1) under the size of the sheet used and the pounds of manure collected. The chart will give you tons of manure applied per acre.
8. If the size of the sheet you used or the pounds of manure collected is not on the chart, use the following formula to get tons per acre.

$$\frac{\text{Pounds of Manure} \times 21.8}{\text{Size of sheet in square feet (length} \times \text{width)}} = \text{Tons of Manure per acre}$$

### Manure Spreader Calibration Worksheet Method 2 - For Liquid Manure

#### Items Needed

- Yardstick or tape measure
- String or rope

#### How To Do It

1. Determine manure spreaders capacity in tons or gallons using the following table:
2. Tie string around tractor tire at the top of tire. Mark the ground directly below string where tire rests on ground. Pull tractor forward until string is again at top of tire (one revolution). Mark ground again as before. Using the tape, measure the distance between the two marks made on the ground. This is the distance the



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- tractor moved with one revolution of the tire.
3. Spread the load, counting the number of times the rope comes to the top of the tire. Multiply the number of revolutions the tire made to spread the load by the number of feet the tractor moved in one revolution (Step 2). This tells you the distance traveled to spread the load.
  4. Next, measure the spreader application width in feet.
  5. Multiply distance traveled to spread the load (Step 3) by width the spreader is covering with manure (Step 4). Divide that number by 43,560 (the square feet in one acre). This tells you the area in acres you covered.
  6. Divide gallons or tons of manure applied (the spreader capacity found in Step 1) by the number of acres covered (Step 5). The result is the tons or gallons applied to that acreage.

$$\frac{\text{Spreader Capacity (Step 1)}}{\text{Acres covered (Step 5)}} = \frac{\text{Tons or gal. manure}}{\text{applied per acre}}$$

Once you have determined the rate you are spreading, you may have to make adjustments in either tractor speed or spreader output. After any change is made, it is recommended that the spreader be recalibrated. Keep in mind it may take several tries to get the proper adjustment to apply the rate you want. When several passes are being made through the field, a small amount of manure being spread should overlap what is on the ground from the previous pass. Too much overlap leads to over-application, too little gives a low application rate and poor distribution of nutrients.

## RESOURCES

If you have any questions concerning the manure spreader calibration worksheet or nutrient management, contact your local Conservation District or Cooperative Extension offices.

**TABLE 1**  
**Manure Spreader Rate Calibration**

Pounds of Manure on Sheet	Size of Sheet	
	-Tons 6' x 6'	Manure/Acre- 10' x 10'
5	3.0	1.1
6	3.6	1.3
7	4.2	1.5
8	4.8	1.7
9	5.4	2.0
10	6.1	2.2
11	6.7	2.4
12	7.3	2.6
13	7.9	2.8
14	8.5	3.1
15	9.1	3.3
16	9.7	3.5
17	10.3	3.7
18	10.9	3.9
19	11.5	4.1
20	12.1	4.4
21	12.7	4.6
22	13.3	4.8
23	13.9	5.0
24	14.5	5.2
25	15.1	5.4
26	15.7	5.7
27	16.3	5.9
28	16.9	6.1
29	17.5	6.3
30	18.2	6.5
31	18.8	6.8
32	19.4	7.0
33	20.0	7.2
34	20.6	7.4
35	21.2	7.6

**TABLE 2**  
**Manure Spreader Capacity Table**

<b>Spreader Size</b>	
if in gallons:	tons of manure
1000 gallons	4 tons
2000 gallons	8 tons
4000 gallons	16 tons
(1 gallon of manure = 8 pounds)	
if in bushels:	tons of manure
75 bushels	2.8 tons
100 bushels	3.75 tons
125 bushels	4.7 tons
150 bushels	5.6 tons
(1 bushel of manure = 75 pounds)	
if in cubic feet:	tons of manure
100 cubic feet	3 tons
200 cubic feet	6 tons
300 cubic feet	9 tons
(1 cubic foot of manure = 60 pounds)	
<b>Other Helpful Conversions</b>	
7.5 gallons per 1 cubic foot of manure	
1.25 cubic feet per 1 bushel of manure	
8 bushel per 1 cubic foot of manure	