

Making Adjustments

If the applicator calibration is not correct, choose the appropriate adjustments to improve accuracy. Some machines may not have all of the adjustment options listed below. Typical adjustments include:

- Orifice Setting—increase size to increase application rate.
- Rotor Speed—increase speed to increase application rate.
- Ground Speed—increase ground speed to decrease application rate for equipment driven by independent PTO, hydraulic, or electric drives.

Note: Changes in ground speed have little or no effect on application rate of ground driven applicators.

Prepared by
Gary Roberson, Extension Specialist
Biological and Agricultural Engineering

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CALIBRATING GRANULAR APPLICATORS

Preparing to Calibrate

The procedures presented in this publication apply to granular applicators for band or directed applications in row crops. Before beginning to calibrate, carefully inspect the applicator to be sure it is in proper operating condition. Repair any components that do not perform according to specifications. Next, determine if a band or directed application is to be made:

- *Band*—chemical application in narrow bands or strips with untreated bands between treated bands; rate usually quoted in pounds per acre.
- *Directed*—chemical application in-furrow, in-row, or along the bed or row; rate usually quoted in pounds per acre or pounds per 1,000 feet of row.

Chemical application rates are usually quoted as broadcast rates. Band application will yield the same chemical rate per acre in the band but less chemical will be used in the field due to the untreated areas between the bands.

Convert the application rate required into a row rate measured in pounds per foot of row length using one of the following equations:

Band Application, rate in pounds per acre:

$$\text{Row Rate (lb/ft)} = \frac{\text{Application Rate (lb/acre)} \times \text{Band Width (ft)}}{43,560}$$

Directed Application, rate in pounds per acre:

$$\text{Row Rate (lb/ft)} = \frac{\text{Application Rate (lb/acre)} \times \text{Row Width (ft)}}{43,560}$$

Directed Application, rate in pounds per 1,000 ft:

$$\text{Row Rate (lb/ft)} = \frac{\text{Application Rate (lb/1,000 ft)}}{1,000}$$

Choose a convenient calibration course in the field. The course should be at least 100 feet but not more than 500 feet in length, the course length will be your calibration distance. Set the equipment for the ground speed desired for application. To determine ground speed, select the gear and throttle setting recommended on the tractor for the required ground speed. On the calibration course in the field, determine the time it takes to drive its length. Drive the course at least twice, once in each direction. Average the times required for the course distance and determine true ground speed (MPH) from the equation below or use Table 1.

$$\text{Ground Speed (MPH)} = \frac{\text{Distance (ft)}}{\text{Seconds} \times 1.47}$$

If the tractor or sprayer is equipped with a true ground speed indicator such as radar or ultrasonic, this speed can be used for calibration. Be sure the indicator itself has been properly calibrated.

Table 1. Ground Speed Chart

Speed	Time (seconds) required to cover course distance				
	100 ft	200 ft	300 ft	400 ft	500 ft
2	34	68	102	136	170
3	23	45	68	91	114
4	17	34	51	68	85
5	14	27	41	54	68
6	11	23	34	46	57
7	10	19	29	39	49
8	x	17	26	34	43
9	x	15	23	30	38
10	x	13	21	27	34

x = not recommended

Calibration Methods

Choose the method that best suits the type of equipment or application to be used. The *Distance Method* can be used for any equipment. The *Time Method* is best suited for applicators driven by PTO, electric motors, or hydraulic motors.

DISTANCE METHOD

1. Calculate the weight of the product that should be collected for the calibration distance used.

$$\text{Weight Required (lb)} = \text{Row Rate (lb/ft)} \times \text{Calibration Distance (ft)}$$

2. Set the applicator according to specifications, run the applicator across the measured calibration course, and collect the output from the applicator in a suitable container. Be sure to maintain a consistent speed. Drive the course twice, once in each direction, to get an average weight.
3. Compare the weight of product collected to the weight required for the calibration distance. If the weights do not agree, make the necessary adjustment and repeat the procedure until the desired accuracy is achieved. Application rate errors should be less than 10%. Once you have the accuracy required, calibration is complete.

TIME METHOD

1. On the calibration course measured in the field, determine the time required to drive the course at the recommended ground speed. Be sure to maintain an accurate and consistent ground speed. Drive the course at least twice, once in each direction, and get an average time.
2. Determine the weight of material required for the calibration distance used.

$$\text{Weight Required (lb)} = \text{Row Rate (lb/ft)} \times \text{Calibration Distance (ft)}$$

3. Park the equipment, set the applicator according to recommendations, and run the applicator for the time measured to cover the calibration course. Collect the output from the applicator and determine its weight.
4. Compare the weight collected to the weight calculated in Step 2. If the two do not match, make the recommended adjustment and repeat the calibration steps until you achieve the required accuracy. Application rate errors should be less than 10%. Once you have the accuracy required, calibration is complete.