

# MU Guide

## Calibrating Granular Pesticide Applicators

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Some pesticides are applied as granules that have been impregnated with a fixed amount of pesticide to eliminate the need for mixing. When used for row crops, most granular pesticides are applied with either a band applicator or a broadcast applicator.

Because some granule applicators are sensitive to speed, it is important to maintain a uniform travel speed for consistent performance. Wind can greatly affect the distribution from granule applicators. Adjust distributors to minimize the effects of wind. To reduce the effects of moisture on the metering of granules, empty the granule hoppers every day.

Granule application rates are affected by the following variables:

- orifice size (feeder-gate setting)
- ground speed
- agitator speed
- size and nature of granules
- roughness of the ground
- humidity
- temperature

This guide describes the procedures for calibrating band and broadcast granule applicators.

### Band applicators

**Step 1. Determine the application rate.** Read the product label and the operators manual for the applicator. The label gives the recommended range of application rates. Be sure to use the correct rate for your particular soil and crop conditions. Normally the label will list the total amount of pesticide granules (product) to apply per acre or the amount of product per 1,000 feet of row. For example: Apply 40 pounds of product per acre, or 8 ounces per 1,000 feet of row.

**Step 2. Calculate the amount of pesticide needed for a known course.** Plan to use a course that is 653 feet long. That distance will provide an accurate calibration and allows the use of the following equation to determine the amount of material that you expect to collect from each application unit:

$$\text{weight of material to collect (oz)} = \frac{\text{rate (lb/acre)} \times \text{width (in)}}{50}$$

It is extremely important to understand the labeled application rate. If the labeled rate is based on band area, the width in the equation is the width of the band in inches. If the labeled rate is based on total area, the width in the equation is the row spacing.

**Band area example:** You want to apply 5 pounds of Lorsban 15G granules per acre on a band that is 15 inches wide.

$$\begin{aligned} \text{weight of material to collect (oz)} &= \frac{5 \text{ (lb/acre)} \times 15 \text{ (in)}}{50} \\ &= 1.5 \text{ oz} \end{aligned}$$

**Total area example:** You want to apply 5 pounds of Lorsban 15G granules per crop acre and the row spacing is 30 inches.

$$\begin{aligned} \text{weight of material to collect (oz)} &= \frac{5 \text{ (lb/acre)} \times 30 \text{ (in)}}{50} \\ &= 3.0 \text{ oz} \end{aligned}$$

**Step 3. Adjust the applicator.** Refer to the applicator instruction manual. The instruction manual should be used as a guide for the initial setting. Open and close the metering gate several times to be sure that it is operating properly. Move the gate control from the closed position to the initial setting so that slack will always be taken up in the same direction each time you change settings.

**Step 4. Add pesticide to hopper.** Read and understand the product label. Observe handling instructions before opening the pesticide container. Wear appropriate protective equipment and clothing. Add the pesticide granules to the hopper until it is half full.

**Step 5. Operate the applicators.** Inspect the applicators for proper operation.

**Step 6. Disconnect the feed tubes from the hoppers.** Close the feeder gates before servicing. Remove the tubes from the unit or secure them away from moving parts.

**Step 7. Attach collection bags to the hoppers.** Secure plastic bags or collection tubes to each unit so that all of the pesticide will be collected during the run over the test course. Collection tubes may be available from your equipment supplier.

**Step 8. Operate the application units over a**

**measured distance.** Lay out a course 653 feet long in field conditions. Travel the course at the same speed and under the same conditions that you will use during application.

**Step 9. Weigh the pesticide collected.** Weigh and record the amount of pesticide collected from each applicator. Weights must be recorded accurately for a good calibration. If the total amount of material collected is only 2.0 ounces, a scale that reads to the nearest tenth of an ounce will be needed to provide a measurement accurate to within 5 percent.

**Step 10. Individually readjust the applicator gate controls.** If too little material was collected, open the gate further to increase the flow rate. If too much product was collected, close the gate completely (as indicated in Step 3) and then reopen the gate to a lower setting.

Repeat Steps 7–10 until the applicators apply the amount of pesticide calculated in Step 2, plus or minus 5 percent.

## Broadcast applicators

**Step 1. Determine the application rate.** Refer to Step 1 for calibration of band applicators.

**Step 2. Calculate the weight of pesticide to apply to a given area.** Choose an area large enough to provide a good test. The width of the area will be the swath width of the applicator. Choose a length large enough to collect a sample that can be measured to within 5 percent. The weight of product to be collected is given by the following equation:

$$\text{lb of product} = \text{rate (lb/acre)} \times \left[ \frac{\text{width (ft)} \times \text{length (ft)}}{43,560 \text{ (ft}^2\text{/acre)}} \right]$$

Example: The swath width of an applicator is 20 feet. You choose the length of the test area to be 240 feet. The desired application rate is 40 pounds per acre.

The weight of product to be collected is given by the following equation:

$$\begin{aligned} \text{lb of product} &= 40 \text{ (lb/acre)} \times \left[ \frac{20 \text{ (ft)} \times 240 \text{ (ft)}}{43,560 \text{ (ft}^2\text{/acre)}} \right] \\ &= 4.4 \text{ lb} \end{aligned}$$

In this example, the scales should be able to weigh the sample to within two-tenths of a pound ( $4.4 \times 0.05 = 0.2$ ) to measure the sample to within 5 percent. If the sample is not large enough to be weighed to within 5 percent, increase the length of the test area.

**Step 3. Adjust the applicator.** Refer to the applicator instruction manual. The manual should be used as a guide for the initial setting. Open and close the metering gate several times to be sure that it is operating properly. Move the gate control from the closed position to the initial setting so that slack will always be taken up in the same direction each time you change settings.

**Step 4. Make a reference mark on the hopper.** The mark should be at a height at least one-third the depth of a full hopper.

**Step 5. Add some product to the hopper.** Operate the applicator to make sure that the material is feeding correctly.

**Step 6. Carefully fill the hopper to the reference mark.** Gently level the granules to avoid packing the hopper. This procedure will need to be repeated exactly to complete the calibration.

**Step 7. Apply the product to the predetermined area.** Drive at speeds and conditions similar to those for a typical application.

**Step 8. Record the weight of the material applied.** Weigh the container, full of product, that you will use to refill the hopper. Refill the hopper to the mark. Refer to Step 4. Weigh the container again. Subtract the two weights to determine the amount of product applied. Compare this to the amount calculated in Step 2. If the weights are within 5 percent of each other, the calibration is complete. Otherwise, proceed to Step 9.

**Step 9. Readjust the metering gate controls.** If too little product was collected, open the gate further to increase the flow rate. If too much product was collected, close the gate completely (as indicated in Step 3) and then reopen the gate to a lower setting. Repeat steps 6–9 until the applicator applies the amount calculated in Step 2, plus or minus 5 percent.

