

Dry Material Equipment (For Pelleted or Granular Formulations)

A. Determine Dry Material Spreader Swath Width:

- Prior to using a dry material spreader, one should determine the equipment's application pattern over its effective swath width.
- Operate the spreader and measure the effective swath width of the dry material as it is applied.

B. Determine Spreader Output in Pounds per Minute:

- Use one of the following methods to measure the output of a dry material spreader in pounds per minute:
 - Catch the spreader output for a known amount of time and weigh the dry material caught.
 - Place a known weight of dry material in the spreader hopper; operate the spreader and measure the time required to empty the hopper.
 - Fill the dry material hopper; operate the spreader while timing, and then weigh the dry material required to fill the hopper to the original fill level.

C. Determine Spreader Output in Pounds per Acre:

$$\text{LBS. PER ACRE} = \frac{\text{LBS. PER MIN.}}{\text{ACRES PER MIN.}}$$

D. Calculate Acres Treated per Hopper:

$$\frac{\text{ACRES PER HOPPER}}{\text{PER HOPPER}} = \frac{\text{HOPPER CAPACITY, LBS.}}{\text{LBS. PER ACRE}}$$

“Broadcast” Application Calibration for Handguns

A. Determine Handgun Swath Width:

- Treat under operational conditions.
- Measure effective swath of spray pattern.

B. Determine Handgun Spray Mixture Output in Gallons per Minute:

- Make a timed catch of handgun spray mixture output.
- Calculate Gallons Per Minute.

(NOTE: ALL OTHER HANDGUN PROCEDURES AND CALIBRATION CALCULATIONS ARE THE SAME AS FOR THE BOOM SPRAYER)

HERBICIDE APPLICATION EQUIPMENT CALIBRATION

A COMPREHENSIVE STEP-BY-STEP GUIDE APPLICATORS MAY USE FOR HERBICIDE APPLICATION EQUIPMENT CALIBRATION

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Introduction: Herbicide equipment calibration is a critical part of any herbicide application process. The following is a step-by-step procedure that one can use to calibrate any aquatic or terrestrial herbicide application equipment. Certain application equipment such as aerial may require slightly modified procedures.

Boom Sprayers

A. Determine Application Equipment Speed:

- Lay out a straight course of reasonable length. For ground application equipment, use a minimum length of approximately 200 feet.
- Operate equipment over the course under operational conditions. Make at least two runs. If wind is a factor in the groundspeed, run both upwind and downwind.
- Use a reliable stopwatch. Stopwatch should be calibrated in minutes, 0.1s and 0.01s of a minute if possible.
- Time the equipment over the course in at least two runs and average the values.
- The application equipment speed is calculated by the relationship below:

$$\text{SPEED, FEET PER MIN.} = \frac{\text{LENGTH OF COURSE, FT.}}{\text{TIME OVER COURSE, MIN.}}$$

B. Determine Boom Swath Width:

- If using a boom sprayer, one may determine the swath width of the boom as shown below:

$$\text{SWATH, FT.} = (\# \text{ OF NOZZLES}) \times (\text{NOZZLE SPACING, FT.})$$

C. Determine Acres per Minute:

- To calculate the acres per minute treated by your application, one may use the relationship below:

$$\text{ACRES PER MINUTE} = \frac{\text{SWATH, FT.} \times \text{SPEED, FT. PER MIN.}}{43,560 \text{ FT}^2 \text{ PER ACRE}}$$

D. Determine Sprayer Output in Gallons per Minute:

- For a boom sprayer or a handgun application, perform a catch of the spray mixture from each nozzle to find sprayer output.

E. Nozzle Uniformity Check:

- For a boom sprayer, always perform a nozzle uniformity check:
 - Catch output separately from each nozzle for a known amount of time.
 - Compare each nozzle's output to the average output of all nozzles on the boom.
 - Each nozzle's output value should be within the desired tolerance (usually 10%).
 - Check and clean or replace any nozzles not within the desired tolerance.
 - Calculate the total boom output in gallons per minute.

F. Calculate Gallons per Acre of Spray Mixture Applied:

- One may calculate the gallons per acre of spray mixture a piece of equipment will apply using the following relationship:

$$\text{GAL. PER ACRE} = \frac{\text{GAL. PER MIN.}}{\text{ACRES PER MIN.}}$$

G. Calculate Acres Treated per Tank:

- To determine the number of acres one tank load of spray mixture will treat, one may use the following relationship:

$$\text{ACRES PER TANK} = \frac{\text{TANK VOLUME, GAL.}}{\text{GAL. PER ACRE}}$$

H. Calculate Amount of Product (Formulation) Required per Tank of Spray Mixture:

$$\text{HERBICIDE PRODUCT PER TANK} = (\text{ACRES PER TANK}) \times (\text{RATE, GAL. PER ACRE})$$