

CALIBRATING FIELD SPRAYERS FOR BRUSH AND SERICEA LESPEDEZA SPRAYING

Preparing to Calibrate. For calibration to be successful, several items need to be taken care of before going to the field. Calibration will not be worthwhile if the equipment is not properly prepared. Calibration should be performed using water only. Follow the steps outlined below to prepare spraying equipment for calibration.

- Inspect the sprayer. Be sure all components are in good working order and undamaged. Pay attention to the pump, control valves, strainers, and hoses. Be sure there are no obstructions or leaks in the sprayer. Be sure all components are in good working order and undamaged. Check all nozzles. Make sure the discharge rate of all the nozzles is within 10% of the overall average. Replace or unclog any nozzle that has an uneven pattern.
- Check the label of the product or products to be applied and record the following:
 - *Application Rate*, gallons per acre (GPA)
 - *Nozzle Type*, droplet size and shape of pattern
 - *Nozzle Pressure*, pounds per square inch (PSI)

Calibrating a Sprayer

1. Accurate ground speed is very important to good calibration.

Set the sprayer for the desired ground speed based on field conditions and run the course at least twice. Average the times required for the course distance and determine ground speed from the equation below.

$$\text{Ground Speed (MPH)} = \frac{\text{Distance (FT)} \times 60}{\text{Time (sec)} \times 88}$$

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. Tractor tachometers, transmission speed charts, and ATV speedometers are often not accurate enough for calibration purposes.

2. Calculate the application rate based on the average discharge rate measured for the nozzles, the ground speed over the test course, and the nozzle spacing, or spray swath on the sprayer.

Boom Sprayers

Measure the discharge rate from a single nozzle on the boom. The spray width will be the distance, in inches, between nozzles.

$$\text{Application Rate (GPA)} = \frac{5940 \times \text{Discharge Rate (GPM)}}{\text{Ground Speed (MPH)} \times \text{Spray Width (IN)}}$$

Boomless Sprayers

Measure the discharge rate from all the nozzles on the sprayer. The spray width will be the distance in feet of the effective spray width. Effective spray width on boomless sprayers is usually 80-85% of the total spray width.

$$\text{Application Rate (GPA)} = \frac{495 \times \text{Discharge Rate (GPM)}}{\text{Ground Speed (MPH)} \times \text{Spray Width (FT)}}$$

3. Compare the application rate calculated to the rate required. If the rates are not the same, choose the appropriate adjustment and reset the sprayer.
4. Recheck the system if necessary. Once it is accurate, calibration is complete.

Variations of the formula to solve for additional variables

$$\text{Ground Speed (MPH)} = \frac{495 \times \text{Discharge Rate (GPM)}}{\text{Application Rate (GPA)} \times \text{Spray Width (FT)}}$$

$$\text{Discharge Rate (GPM)} = \frac{\text{Application Rate (GPA)} \times \text{Ground Speed (MPH)} \times \text{Spray Width (FT)}}{495}$$

Documentation of your sprayer calibration:

Ground Speed

Target speed = _____ MPH

$$\text{MPH} = \frac{\text{Distance (FT)} \times 60}{\text{Time (sec)} \times 88}$$

Discharge Rate

_____ GPM

$$\text{GPM} = \frac{\text{Gallons Collected} \times 60}{\text{Collection Time (sec)}}$$

Spray Width

_____ Ft or In

Boom => Distance between nozzles

Boomless => Total Spray Width x 85%

Application Rate

_____ GPA

Minimum 20 GPA recommended for sericea lespedeza & brush control

Calculations