

Boom Sprayer Calibration Worksheet

Edward W. Hellman
North Willamette Research & Extension Center
Oregon State University

Proper setup and calibration of your sprayer is necessary for an accurate pesticide application rate. Sprayer calibration should be done at least once per season if the sprayer is used for only one type of application. But if you adjust the application rate (gallons per acre) or change nozzles for a different type of application, the sprayer must be recalibrated.

1. Nozzle selection

Make sure the nozzles are the appropriate style and size for the next spray application. Nozzles are designed for specific spray applications: broadcast, band, or directed spray. The list below outlines the most common nozzle styles for each type of application.

Style

Broadcast: flat (fan), flood, full cone
Band: even, hollow cone
Directed: hollow cone, full cone

Arrangement

Proper nozzle arrangement is critical for a uniform and accurate application. Check the following items:

- * spacing along boom
- * angle of alignment along boom (influences spray pattern)
- * height above target
- * number of nozzles/row for directed applications

Size

Nozzle size and spray pressure determine a nozzle's output (gal/min), which together with tractor speed, determines the sprayer's application rate (gal/acre). Correct nozzle size must be selected to deliver the desired application rate. Remember that nozzles wear out over time, enlarging the orifice and increasing their output.

2. Determine the required nozzle size (gal/min)

Required information:

Fill in the following known quantities, insert into the equation below, and calculate the result.

(A) _____ ft/min. Tractor speed

Measure speed (ft/min.) by conducting a test spraying run (use water) through the field using your standard gear, throttle, and pressure guage settings.

(B) _____ gal/acre Desired application rate

Gallons per acre from pesticide label instructions for use.

(C) _____ ft Spray width

Area (ft) treated by one nozzle. For multiple nozzle, directed spray applications, divide spray width by number of nozzles treating that area.

Calculate required nozzle output in gpm

(A) _____ ft/min. X (B) _____ gal/acre X (C) _____ ft. = (D) _____ gal/min{ required nozzle output}

43,560 ft²/acre

3. Compare required nozzle output with actual output.

Measure output of **each** nozzle:

- * Partially fill spray tank with water.
- * Run sprayer at your standard spray pressure and collect nozzle output for 20 sec. in a jar calibrated in fluid oz.

For each nozzle, measure the volume collected in 20 sec. = (E) _____ fl.oz.

(E) _____ fl. oz. X 3
_____ = (F) _____ gal/min actual nozzle output
128 fl.oz./gal.

For each nozzle, compare:

Required nozzle output (D) _____ gal/min

Actual nozzle output (F) _____ gal/min

- * Change nozzle size if output is 20% greater or less than your calculated nozzle size, then recalibrate.
- * Replace worn nozzles having output 10% higher than a new nozzle (same size) at your pressure.
- * Make fine adjustments to output by adjusting tractor speed or spray pressure, then recalibrate.

* Observe nozzle spray for correct pattern, replace if needed.

4. Prepare the spray mixture.

Desired application rate, recorded above: (B) _____ gal/acre

Total volume of spray mixture desired: (G) _____ gal

Pesticide application rate, quantity per acre from label (H) _____ (lb, oz, gal)

(G) _____ gal total volume _____ = (I) _____ acres treated

(B) _____ gal/acre

(I) _____ acres

(H) _____ = _____ quantity of pesticide needed in spray mixture