How to accurately calibrate your field sprayer

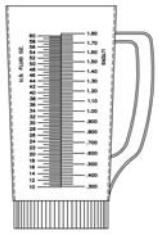
This guide can help you improve spray product performance and save many dollars of wasted material by:

1. ***Assuring overall accuracy and coverage*** of your field sprayer. *A GPS-controlled sprayer system is only as accurate as its calibration.*
2. ***Finding worn spray tips*** which can over-spray or apply a poor pattern.

Items you'll need

1. Graduated calibration cup
2. Calculator; 300-ft. tape measure
3. One new spray tip matching existing tips on your sprayer
4. Digital wristwatch or stopwatch to measure seconds
5. Tip cleaning brush

An accurate hand-held GPS unit is helpful to measure distance and speed.



Step 1: Determine field speed in MPH.

Maintaining a constant, accurate field speed is your baseline for uniform spraying. Speedometer readings vary with field conditions and slippage, so an accurate GPS or stopwatch measurement is important. Running your trial with a half-full tank will produce the most accurate measurement.

Measure and flag a 300-ft. distance, and record travel time in seconds. Repeat three times; use the average to calculate miles per hour (MPH) with this formula:

$$\text{MPH} = \frac{(300 \text{ ft.} \times 60)}{\text{Seconds} \times 88}$$

Example:

$$6.01\text{MPH} = \frac{(300 \text{ ft.} \times 60)}{34 \text{ sec.} \times 88}$$

Vary the RPM, hydrostat or gear settings until you determine the desired speed, and note these settings on your field spraying checklist so any operator can set up for this standard speed.

Step 2: Compute delivery rate needed per tip

This formula finds the gallons per minute (GPM) *each tip must deliver at your standard field speed* to apply the required gallons per acre:

$$\textbf{GPM} = \frac{\textbf{GPA} \times \textbf{MPH} \times \textbf{W}}{5{,}940 \text{ (constant factor)}}$$

GPA is gallons needed per acre, **MPH** is miles per hour and **W** is tip spacing in inches. Example:

$$\textbf{0.404 GPM} = \frac{\textbf{20} \times \textbf{6} \times \textbf{20}}{5{,}940 \text{ (constant factor)}}$$

Using this example, you'd need to adjust the sprayer pressure to deliver 0.4 gal. per minute (51.7 ounces).

Make sure your sprayer tips are designed for your intended rate in gallons per acre: Check the manufacturer's specification tables. For instance, your tips may be designed for optimum coverage at 20 gal. per acre at 6 mph and 50 lbs. of pressure at the tip, assuming 20-inch tip spacing.

3. Set correct pressure for accurate delivery.

Clean the sprayer with our recommended tank and system cleanout product and procedures. Check for leaks or blockage. Replace one tip and strainer with an identical new tip and strainer. This is the tip you'll check for accurate delivery of required gallons per acre.

Turn on your sprayer pump; set engine RPM at the standard speed you determined in Step 1.

With the calibration cup, collect and measure volume of spray from the new tip for one minute. Fine-tune the pressure control until you collect 0.40 gpm (almost 52 ounces).

In this example, the sprayer will deliver 20 gal. per acre at 6 miles per hour — if all tips are performing like the new one.

Step 4: Find worn or partially plugged tips.

Check the flow rate of each tip. If it's 7% more or less than the new tip, replace it. If you find a second and third tip that's off by 7% or more, it's a signal that *all* tips should be replaced. Worn tips make calibration futile.

See other side for valuable online information on sprayer calibration — including convenient web-based calculators which make these formulas easier to use.