Calibration

The volume of spray applied per acre is affected by the following:

1. The type of nozzle.
2. Number of nozzles per row.
3. Row Width.
5. Pressure.
6. Nozzle spacing on the boom.

Regardless of how you calibrate a sprayer, all of these factors must be considered.

The row width and nozzle spacing are probably set before calibration time. Choose nozzle tips that will give the pattern and volume recommended for the spray material you will use. The number of nozzles per row id determined by the size of the plant and the reason for spraying.

Before calibrating your sprayer, make sure the pump is free to turn. Rinse the tank and fill it with clear water. Remove the nozzles, screens and strainers and clean them with a soft brush and detergent. Do not use any metal device that could damage these delicate parts. Check to be sure the sprayer has the right nozzle type for the spray material to be applied before beginning calibration.

Start the sprayer and check all operating parts. Replace any defective parts. Flush the pump, hoses and boom with clear water.

Check the delivery rate of the nozzle tips for uniformity by placing same-size containers under the nozzles so that the flow from each nozzle is caught in a container. If the amounts caught are different, the tips are probably worn and the discharge patterns are probably not even. If the tips show a big difference in delivery volume, replace all the tips.

Procedure

There are many correct methods for calibrating a sprayer, but most of them are rather complicated. Here is a relatively simple method, commonly called "The Hundred-Foot Method."

If you are broadcasting, assume your row spacing is the same as the nozzle spacing on the boom.

**Step 1.** In the field, measure off the distance (See Table M4.1) to be sprayed.

**Step 2.** Clock the number of seconds it takes to drive the spray rig this distance in the gear and at the throttle setting you will use to spray. Make several runs over the distance and average the times it takes. mark the throttle setting you used.
<table>
<thead>
<tr>
<th>Row Spacing (inches)</th>
<th>Distance to Measure (feet)</th>
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<tbody>
<tr>
<td>44</td>
<td>93</td>
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<td>42</td>
<td>97</td>
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<td>20</td>
<td>204</td>
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<td>18</td>
<td>226</td>
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</table>
Step 3. With the rig standing still, engage the pump, set the throttle at spraying position, and set the sprayer pressure. Catch the output from each nozzle for the number of seconds it took to cover the measured distance. Measure the output from several nozzles and find the average in ounces.

Step 4. Multiply the average output caught in Step 3 by the average number of nozzles per row width that you selected from Table M4.1. For example, if you select 42-inch row spacing from Table M4.1 and your nozzles are spaced 20 inches on the boom, your average number of nozzles per row would be 42/20 or 2.1. If you caught 10 ounces from the nozzle in Step 3, multiply by 2.1 and your output is 21 gallons per acre.

Step 5. Divide the capacity of your tank by the gallons that will be applied per acre (figured in Step 4) to find the number of acres you can treat per tank of spray.

Step 6. (a) For broadcast treatment, multiply the recommended rate per acre for the chemical you will use by the number of acres your tank will cover (figured in Step 5).

(b) For band treatment, adjust the amount of material to be applied according to the proportion of the row width which the band covers. (For example: if you will spray a 14-inch band on 42-inch rows, multiply the recommended broadcast rate by 14/42 or 1/3). Then multiply by the number of acres your tank will cover.

Step 7. To prepare the spray, fill the tank more than half full with water and pour in the right amount of the chemical while the pump is running. Then finish filling the tank. When using wettable powders, make a slurry in a separate container and then add the slurry to the tank.

Example: A corn producer wants to apply an 80% wettable powder herbicide on a 14-inch band at the broadcast rate of 2 pounds of active ingredient per acre on 42-inch rows. His sprayer tank has a 100-gallon capacity.

Step 1. He measures off 97 feet in the field to be planted (from Table M4.1).

Step 2. He drives the spray rig 97 feet in the gear and at the throttle setting he will be spraying. It takes him 13 seconds to cover 97 feet.
Step 3. He runs the pump and finds that each nozzle is delivering an average of 15 ounces in 13 seconds.

Step 4. Since he is using one nozzle per row, he will be applying 15 gallons of spray mixture per acre. (If he had been using two nozzles per row, he would be applying 30 gallons per acre.)

Step 5. With a 100-gallon tank, one tank will cover 6.7 acres (100/15 = 6.7).

Step 6. Since he is treating a 14-inch band, he must adjust the amount of herbicide to be mixed in the tank by the ratio of the bank width to the row width.

*Calculate as follows:*

\[
\frac{14 \text{ in. (band width)}}{42 \text{ in. (row width)}} = \frac{1}{3} \times 2 \text{ lb.}/\text{A} \text{ (recommended rate)} = \frac{2}{3} \text{ lb.}/\text{A.}
\]

\[
\frac{2}{3} \text{ lb.}/\text{A} \times 6.7 \text{ acres (tank coverage)} = 4.5 \text{ lb. active ingredient per tank.}
\]

\[
\frac{4.5 \text{ lb.}}{80\% \text{ (wettable powder)}} = 5.6 \text{ lb. herbicide material per tank.}
\]