Final mixing

Once a sprayer is calibrated, you will then be able to mix the herbicide in the spray tank properly. For example, if your recommended herbicide rate is 1 quart per acre and your sprayer is calibrated to deliver 15 gpa, you would then add 1 quart of herbicide for every 15 gallons of spray in the tank.

Keep these points in mind

- To properly calibrate a herbicide sprayer, you must be able to accurately set and maintain speed and pressure.
- Make sure all the nozzles are in good condition and of the proper type.
- Never use a knife or other hard object to clean or clear clogged nozzles.
- Nozzles wear. Recalibrate sprayers often and replace nozzles when they become worn.
- Most nozzles used for broadcast herbicide applications on rangeland are designed to operate between 20 and 30 psi.
- In general, a minimum total spray volume of 10 gpa is recommended when using ground broadcast equipment.
- A ground speed of 3 to 4 mph is generally optimum when applying a broadcast herbicide spray to rangeland.
- Broadcast sprays can drift, especially when boomless nozzles are used.
- Read and follow the herbicide label directions.

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Sprayer Calibration Guide

Safe and effective four-step method to calibrate herbicide sprays

Weed Treatment Series

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Sprayer calibration is important. If you apply too much herbicide, costs can become excessive; you may be in violation of the label; and you might cause environmental damage. If you apply too little herbicide, the weeds may not be controlled adequately.

Many sprayer calibration methods are available and can be used successfully. The Weed Busters procedure is relatively fast and simple and can be used for most spray systems.

To properly calibrate your sprayer, follow the four simple steps below.

① Determine Speed

If your speedometer is accurate, you can skip this step. The speedometers of most "standard equipment" all-terrain vehicles (ATVs) are inaccurate at low speeds.

If the spray vehicle is equipped with a tachometer, you can use it to set and hold an accurate speed. If not, you may need to buy an after-market speedometer.

To determine the correct number of miles per hour (mph), set two stakes 88 feet apart on terrain similar to application site. Hold the throttle at a defined rpm (revolutions per minute) and gear, and record in seconds the amount of time it takes to drive 88 feet.

Repeat this procedure at least once, then calculate the average number of seconds to travel 88 feet. To calculate mph, divide by 60 the number of seconds required to drive the course. Be sure to record the speed, rpm and gear for later reference.

Example: It takes 12 seconds to drive 88 feet.

$$60 \div 12 = 5 \text{ mph}$$

② Determine the Sprayer Swath Width

For boom sprayers, simply multiply the number of nozzles by the distance in inches between each nozzle and divide by 12.

Example: You have nine nozzles spaced 20 inches apart.

$$(9 \times 20) \div 12 = 15 \text{ feet effective swath width}$$

For boomless sprayers, operate the nozzle at the desired pressure on a dry surface. Measure the width of the spray swath. Then subtract 10 percent to calculate the effective swath width.

Example: The boomless nozzle has a swath width of 20 feet.

$$20 \text{ feet} - (20 \text{ feet} \times 0.10) = 18 \text{ feet of effective swath width}$$

③ Calculate the Amount of Time to Spray 1 Acre

Using the swath width and speed as determined above, calculate the amount of time needed with the following formula:

$$\frac{43{,}560 \div \text{swath width (feet)}}{(\text{mph} \times 88)} = \text{minutes/acre}$$

Example: Sprayer will travel at 3 mph and deliver a 15 ft swath.

$$\frac{43{,}560 \div \text{15-foot swath}}{3 \text{ mph} \times 88} = 11 \text{ minutes to spray 1 acre}$$

④ Determine the Number of Gallons/Acre

If the spray tank is marked in gallons, fill it with water to a specific level and record that number (such as 20 gallons). Operate the sprayer at a set pressure (20 to 30 pounds per square inch, or psi) for the number of minutes you calculated it takes to spray 1 acre. Record the volume of water remaining (such as 5 gallons).

The difference between the starting number of gallons and the remaining number of gallons is the number of gallons per acre the sprayer delivered (such as: 20 gallons to start - 5 gallons remaining = 15 gallons per acre delivered). The sprayer is now calibrated.

If the spray tank is not marked and you are using a spray boom, use the procedure above in terms of setting pressure and time, but capture the spray from one nozzle. To determine the number of gallons per acre, measure the amount of the spray collected and then multiply that amount by the number of nozzles on the spray boom.

Repeat this procedure on several nozzles and average the results. The sprayer is now calibrated.

Example: 1.5 gallons collected from one nozzle on a nine-nozzle spray boom.

$$1.5 \text{ gallons} \times 9 \text{ nozzles} = 13.5 \text{ gallons per acre}$$

If the spray tank is not marked and you are using a boomless nozzle, you will have to shroud the nozzle with a plastic bag or similar product to direct the spray into a collection container. The total volume of liquid collected over the amount of time to spray 1 acre is equal to the number of gallons per acre that the sprayer is delivering. The sprayer is now calibrated.

For any of the above spray systems, if you wish to increase the number of gallons per acre (gpa), you can either decrease speed of travel or increase the pressure and recalibrate. The reverse is true if you wish to decrease the gpa.