

Single-Nozzle Backpack or ATV Sprayer Calibration¹

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Many growers have isolated patches of weeds that should be controlled to prevent their spread. In this case, spot spraying with a herbicide would be the most economically feasible approach. Some herbicide labels allow for spot-treatments. However, the recommended amount is often given in % volume of herbicide per volume of water, or a certain amount of herbicide per 1,000 square feet.

Before adding any herbicide to the spray tank, it is extremely important that the output of the sprayer is known. That is, it must be properly calibrated. This allows for reduced herbicide costs and optimum weed control. A simple calibration test for a single-nozzle backpack or ATV sprayer is shown in Table 1. No math is required for this calibration, and the end result is a known output volume for your sprayer in gallons per acre (GPA).

Hints for calibration:

- Keep speed constant. This will ensure that you are walking the same speed at all times.
- Keep the nozzle at the same height at all times—a height that is comfortable.
- Modify the wand by adding a pressure gauge. Try to keep the pressure as constant as possible. Do not let the pressure fall below 10 psi.

Next the amount of herbicide to be added to the spray tank needs to be calculated. To do this multiply the amount of herbicide needed for 1 gallon by the number of gallons in the spray tank.

Example: A sprayer is calibrated with an output of 40 GPA and the tank holds 10 gallons. If the desired herbicide rate is 1 quart per acre, from Table 2, the amount of herbicide for 1 gallon of water is 4.75 tsp. Since the spray tank holds 10 gallons, 47.5 (48) tsp are needed, which is approximately equal to 7 fl oz.

Useful Conversions:

1 teaspoon = 0.17 fl oz

1 tablespoon = 0.5 fl oz

3 teaspoons = 1 tablespoon

1 pint = 16 fl oz = 32 tablespoons = 2 cups

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Use herbicides safely. Read and follow directions on the manufacturer's label.

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Table 1. A no-math method for calibrating single-nozzle backpack or ATV wand sprayers for spot spraying herbicides.

Step 1	Measure a calibration plot that is exactly 18.5 feet by 18.5 feet.			
Step 2	Spray the calibration plot uniformly with water. Repeat 3 times and record the average number of seconds needed to spray the entire plot.	Time Required	_____	Seconds
Step 3	Spray into a clean bucket for the amount of time recorded in Step 2.			
Step 4	Measure the number of ounces of water in the bucket.	Volume Sprayed	_____	Ounces
Step 5	The number of ounces collected from the bucket is equal to the number of gallons per acre the sprayer is delivering.	Output Volume	_____	Gallons/Acre
Step 6	Determine the volume of the spray tank.	Tank Volume	_____	Gallons
Step 7	Determine the number of acres covered in one tank. Divide tank volume (gallons; Step 6) by output volume (gallons/acre; step 5).	Area covered per tank	_____	Acres
Step 8	Determine the amount of herbicide to add to the tank from Table 2.	Herbicide/Acre	_____	tsp, tbsp, mL, oz, cups

Table 2. Amount liquid herbicide to add to 1 gallon of water. Abbreviations: tsp=teaspoon, fl oz=fluid ounces.

Volume (GPA)	Recommended Herbicide Rate per Acre				
	1 pint	1 quart	2 quarts	3 quarts	4 quarts
20	5 tsp	10 tsp	3.25 fl oz	4.75 fl oz	6.33 fl oz
30	3 tsp	6 tsp	2 fl oz	3.25 fl oz	4.25 fl oz
40	2.33 tsp	4.75 tsp	1.66 fl oz	2.33 fl oz	3.25 fl oz
50	2 tsp	3.75 tsp	1.25 fl oz	2 fl oz	2.5 fl oz
60	1.66 tsp	3.25 tsp	6.33 tsp	1.66 fl oz	2 fl oz
70	1.33 tsp	2.75 tsp	5.5 tsp	1.33 fl oz	1.75 fl oz
80	1.25 tsp	2.33 tsp	4.75 tsp	7.25 tsp	9.5 tsp
90	1 tsp	2 tsp	2.25 tsp	6.33 tsp	8.5 tsp
100	1 tsp	2 tsp	3.75 tsp	5.75 tsp	7.66 tsp