



Easy Calibration for Backpack and Canister (Handheld) Sprayers

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Sprayer Calibration Benefits

1. Apply chemical uniformly and in accordance with label-recommended application rates.
2. Maximize the efficacy and reduce variation of the chemical applications, resulting in better crop performance, yield, and profit.
3. Avoid inaccurate and non-uniform applications, which can violate label restrictions, waste resources (time, fuel, chemical), and cause environmental harm.

Introduction

When applying pesticides, fertilizers, and other chemicals, the applicator should know the amount of chemical applied to the treated area. Calibration is a method an applicator can use to measure and set the application rate. If sprayers are not properly calibrated, it can result in over or under application of chemicals, causing damage, reduced pest control, and potential safety concerns. Making the effort to properly mix chemicals and calibrate sprayers can save money and increase treatment effectiveness. This fact sheet provides simple guidelines for calibrating backpack and canister sprayers.

Getting Started

- Calibration is measuring how many gallons the sprayer applies per acre.
- This method requires little math.
- There are 128 ounces (oz) in 1 gallon (gal), which means counting the number of ounces applied to 1/128 acre (340.3 ft²) equals gallons per acre (Ferrell, 1998; Figure 1).

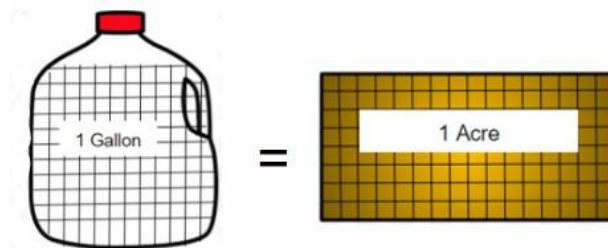


Figure 1. Comparison between 128 ounces in 1 gallon and an acre divided into 128 (340.3 ft²) sections.

Equipment Inspection

1. Clean and inspect the equipment to ensure it is free of pesticide residue and in working order (Figure 2).
2. Check sprayer for functionality and uniform spray pattern.
Note: Do not clear blockages in the spray gun or nozzles with your bare hands or mouth. Use appropriate tools or compressed air.
 - a. Does the sprayer build pressure as it is pumped?
Does the pattern appear even or as advertised by the manufacturer? If not, clean or replace the nozzle or appropriate parts.
 - b. Does the spray gun leak after the trigger is released?
If so, the check valve, hose, or gun may need to be replaced.
3. Once equipment passes inspection, proceed to calibration.



Figure 2. Winter storage damaged this spray gun. Proper winterization saves time and money.

Calibration Steps

- Step 1.** Measure out an 18.5 ft by 18.5 ft square on pavement or dry ground. It is important that you can see the water you spray on the ground so you only spray the same area once.
- Step 2.** Time yourself spraying the area within the square (Figure 3). Aim to be consistent with the speed you normally treat an area. Repeat this step a few times and average your time. You may need to measure out new squares to do this.



Figure 3. The blue lines mark the boundary of an 18.5 ft by 18.5 ft square. Parking spaces are useful for squaring the corners of the spray area.

Average time in seconds: _____

- Step 3.** Spray fresh water into a container for the same amount of time as measured in step 2 (Figure 4). Repeat this step a minimum of three times and calculate the average.

Average oz measured: _____

The average ounces measured equals the number of gallons per acre. For example, 40 oz measured = 40 gal per acre.

Write down your gal per acre here: _____

Date: _____

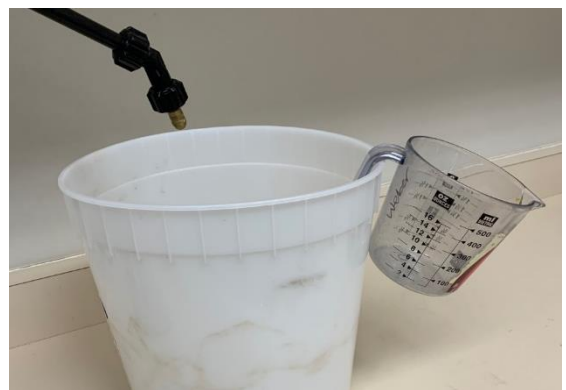


Figure 4. A large container will catch all the water sprayed for the time measured in step 2. The water can then be poured into the graduated measuring container. The container should measure ounces.

Photo Credit

Authors provided all photos.

References

Ferrell, M. A. (1998). *1/128 method of calibration: Calibrating hand sprayers and high pressure hand guns* [Fact sheet MP-93.3]. University of Wyoming Extension. <https://uwyoextension.org>

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