

Spray Gun Calibration¹

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This document provides step-by-step details for calibrating spray guns used in various pest-control settings.

Introduction



Figure 1. Application to a residential lawn. Photo credit: UF/IFAS Pesticide Information Office.

Hand-held spray guns are used in various pest-control settings, including but not limited to lawns and ornamentals, agricultural tree crops, aquatic sites, and rights-of-way (Figures 1–3).

These spray guns operate off truck-, tractor-, or boat-mounted pumps and spray tanks. A first step prior to making any application is to determine sprayer output, which is done through calibration.

Calibration simply refers to the proper adjustment of equipment to apply the correct amount of material to the target site.



Figure 2. Application to citrus. Photo credit: UF/IFAS Pesticide Information Office.

Lawn Applications

There are four factors that are critical to calibrating hand-held spray gun equipment for applying the correct rate to a site of known area, such as a lawn:

- Sprayer pressure
- Proper walking pace

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Figure 3. Application to an aquatic site. Photo credit: UF/IFAS Pesticide Information Office.

- Uniform hand/arm motion
- Relatively constant nozzle height and angle in reference to the ground

The Process

1. Select the volume of water you want your sprayer to apply. Use the pesticide label as a guide (Figure 4). Most labels will state spray volume on a per-acre or per-1,000 ft² basis. The label pictured in Figure 4 features a table that provides a range of 0.1–5.0 gallons of spray volume per 1,000 ft².
2. Spray a 1,000 ft² test course using water only. To determine how far to walk, measure your spray gun's swath width at a pace and arm motion with which you are comfortable. Measuring swath width is easiest on dry pavement where a water film is visibly evident (Figures 5–6). Dry pavement will also allow you to check for uniformity of application. For example, if your swath width was measured to be 8 feet, dividing 8 feet into 1,000 ft² gives a linear distance of 125 feet for your test course.
3. Determine the amount of time that it takes to walk the test course using a stopwatch or watch with a second hand. Repeat twice to obtain an average time. For example, your three times were 34, 36, and 37 seconds, respectively, for an average of 36 seconds.
4. Determine the gallons sprayed per 1,000 ft² by catching the sprayer output in a bucket for 36 seconds and then measure in a graduated

measuring container (Figures 7–8). In this example, if the amount of spray caught in the bucket was between 0.1 and 5.0 gallons, then the application would be made as directed by the product label (step 1).

5. Determine the amount of pesticide to add to the spray tank. For example, let us assume you are going to be treating centipede grass and hybrid Bermuda grass lawns. The label from Figure 4 states to apply 0.75–1.5 fluid ounces of product per 1,000 ft². You decide to apply a rate of 1.0 ounce of product per 1,000 ft². You determined from step 4 that your sprayer's output is 2.5 gallons per 1,000 ft². You wish to mix a full load and your truck-mounted spray tank holds 100 gallons.

5a. Determine the total number of square feet that 100 gallons will treat. In other terms, it may be easier to think of this as the number of 1,000 ft²-sections a full tank will treat: 100 gallons ÷ 2.5 gallons/1,000 ft² = forty 1,000 ft² sections, or 40,000 ft².

5b. Measure and add the product to the tank: forty 1,000 ft² sections x 1.0 oz/1,000 ft² = 40 ounces of product to mix a full 100-gallon tank.

Sprays to Achieve Coverage

Some labels will have statements indicating that the product may be applied as a "spray-to-wet" application. When this is the case, the label will provide mixing directions stated as "% solution."

The Process

1. Determine the amount of spray solution that will be mixed; for example, 3 gallons.
2. Check the label for the recommended percent solution to apply (Figure 9); for example, 1.6%.
3. Determine the amount of product needed to make up 3 gallons of spray solution.
 - 3a. Convert percent solution to its decimal equivalency: 1.6% = 0.016.

3b. Multiply the decimal equivalency by the amount of spray solution: $0.016 \times 3 \text{ gallons} = 0.048 \text{ gallons}$.

3c. Convert to ounces for ease of measuring: $0.048 \text{ gallons} \times 128 \text{ fluid ounces/gallon} = 6.1 \text{ ounces}$ of product needed to make 3 gallons of spray solution.

TABLE 1. RATE RECOMMENDATIONS FOR SOD FARMS, ORNAMENTAL LAWNS AND TURFGRASS.

Species	Amount of Product, Pints/Acre	Spray Volume, Gallons/Acre	Amount of Product, fl. oz./1,000 sq. ft.	Spray Volume, Gallons per 1,000 sq. ft.
WARM-SEASON TURF				
Bahia grass, Buffalo grass, Centipede grass, Hybrid bermudagrass, Kikuyu grass, Seashore paspalum and Zoysiagrass.	2-4	3-220	0.75-1.5	0.1-5.0
Common bermudagrass	3-5	3-220	1.1-1.8	0.1-5.0

Figure 4. Labels provide guidance with selecting application volume. Photo credit: CDMS.



Figure 5. Checking swath width. Photo credit: UF/IFAS Pesticide Information Office.



Figure 6. Checking swath width. Photo credit: UF/IFAS Pesticide Information Office.



Figure 7. Checking sprayer output. Photo credit: UF/IFAS Pesticide Information Office.



Figure 8. Checking sprayer output. Photo credit: UF/IFAS Pesticide Information Office.

6.3 Mixing for Hand-Held Sprayers

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Desired Volume	Amount of Roundup PRO Concentrate Herbicide					
	0.4%	0.8%	1.2%	1.6%	4.0%	8.0%
1 Gallon	0.5 oz	1.0 oz	1.6 oz	2.1 oz	5.2 oz	10.5 oz
25 Gallons	13.0 oz	0.8 qt	1.2 qt	1.6 qt	4.0 qt	8.0 qt
100 Gallons	1.6 qt	0.8 gal	1.2 gal	1.6 gal	4.0 gal	8.0 gal

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

Figure 9. Label spray solution mixing directions. Photo credit: CDMS.