# Calibrating Hand-Held Sprayers

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Do you need to spot spray weedy patches in the lawn or pasture with a hand-held sprayer? We will discuss a simple step-by-step calibration procedure that ensures you apply the correct amount of pesticide to comply with the product label and so you will achieve satisfactory results.

In order to apply the recommended amount of chemical through a sprayer, you need to know two things:

1. The quantity of total spray output you will be applying per unit of area, e.g., gallons per acre (GPA); and,
2. The recommended amount of product to apply per acre.

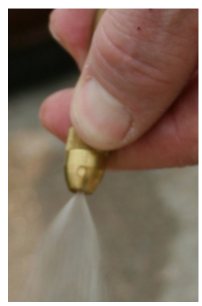
I recently came across a simplified method of calibrating hand-held sprayers. This methodology works for calibrating either compressed air (pump up) sprayers or sprayers with a motor driven pump to create pressure (hand guns). The following procedure illustrates the steps required to properly calibrate hand-held sprayers. Most of the procedure is the same whether you are using a compressed air or powered sprayer. Italicized text applies only to compressed air sprayers.

## Measure Spray Output

1) Note the "full" mark on the spray tank. *There will be space above the mark for compressed air.*
2) Determine the useful volume of the spray tank by measuring the volume of water needed to fill an empty tank to the full mark.

This spray tank holds 2 gallons when full.

3) Using only water, fill the container to the full mark. Start the motorized pump or pressurize the tank, then test the spray pattern. Add pressure and/or adjust the spray tip until you are satisfied with the spray pattern.



Test spray pattern and adjust tip.

4) Measure and mark a test area 18.5 feet x 18.5 feet square
5) Spray the test area in the manner you would normally do when controlling the target pest and record the time in seconds to treat the test area.
6) *Pump up the pressure again and* spray into a container for the same number of seconds it took to "treat' the test area (step 5) and measure the fluid ounces (fl.-oz.) caught in the container. The number of fl.-oz. caught in the container will be equal to the gallons of spray you would have applied had you sprayed a full acre (GPA).

Spray in a container for the same number of seconds.

## Determine the Amount of Chemical to Add to the Tank

7) Divide the useful capacity of the tank (step 2) by the spray output, GPA (step 6) to determine the decimal fraction of an acre covered by each tank of spray solution.

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**Measure a test area 18.5 feet x 18.5 feet square. Then spray in the manner you would normally do and record the time in seconds to "treat" the test area.**

8) Read the label to determine the volume of product recommended per acre.
9) Multiply the volume of product per acre (step 8) by the fractional acre covered per tank (step 7) to determine the amount of product to add per tank of spray.

## Example

- **Note the full mark. (Step 1)**
- **Tom measured the useful volume of the spray tank and found it to be two gallons. (Step 2)**
- **Test spray pattern. (Step 3)**
- **He measured and marked a test area 18.5 x 18.5 feet. (Step 4)**
- **He sprayed the test area and found it took 32 seconds. (Step 5)**
- **He caught the output in a container for 32 seconds and measured 34 fluid ounces of water caught. This shows Tom was putting out the equivalent of 34 gallons per acre. (Step 6)**
- **Each tank will cover 2 gallons / 34 gallons / acre = 0.059 acre (Step 7)**
- **The product label recommends 1 quart (32 fl.-oz.) of herbicide per acre. (Step 8)**
- **The amount of product to add to a full spray tank is: 32 fl.-oz. per acre x 0.059 acres per tank = 1.9 fl.-oz. per spray tank. (Step 9)**

*This methodology works because the test area (18.5 feet square) is 1/128 of an acre. A U.S. gallon is 128 fluid-ounces. The fluid ounces of spray required to treat the test area therefore is equivalent to the gallons of spray output that would be applied to a full acre, provided the operator maintains a consistent pattern of spray output and spray coverage.*

## How to Measure Small Quantities of Pesticide

You could measure small quantities of pesticides using a number of different measuring devices. Three common examples are:

- A measuring cup (Dedicate a measuring cup for garage use only. Never use the same cup that is used for cooking.)
- A tablespoon (Tbsp) (If you will be using an old tablespoon from the silverware drawer, check volume by pouring water from a measuring spoon into the spoon designated for pesticides to check the actual volume.)
- A disposable syringe calibrated in milliliters (These are sold at veterinary supply and farm supply stores). This is my personal favorite because you suck chemical into the syringe instead of pouring chemical from the bottle into an open measure which can spill on your hands or clothes. A syringe accurately measures any volume up to its full capacity.

**Disposable syringe**

The calculations below demonstrate how to compute the chemical needed for our example using these three fluid volume measuring devices.

- 1.9 fl.-oz. /8 fl.-oz./Cup = 0.24 Cup per tank. Add just under 1/4 cup of product per tank.
- 1.9 fl.-oz. x 2 Tbsp per ounce = 3.8 Tbsp. Add just under 4 Tbsp per tank.
- 1.9 fl.-oz. x 29.6 milliliters (ml)/fl.-oz. = 56.2 ml. Add just over 56 ml per tank.