

## Frequently asked questions

**Q: If I calibrate my sprayer once at the beginning of the season, do I have to do it again?**

A: Yes. It is important to calibrate your sprayer every time you use it to ensure it is in proper working order.

**Q: How do I know how much pesticide mixture I need for a spot application?**

A: When making spot applications such as to a single shrub or a row of vegetables, do a trial application with clean water before adding the pesticide.

Fill your sprayer with water to a level that is easily recognized and spray the plant(s) to be treated, being sure to get complete coverage.

Determine how much water was used by measuring the amount of water needed to refill the sprayer to the same level that you started with.

Empty the sprayer and refer to the label to determine how much pesticide product to mix per volume (e.g., gallon) of water.

Measure and add the necessary amount of water and pesticide product into your sprayer by following the procedure as described in Home PEST brochure #6, "Mixing Pesticides."

Be sure the plants that you intend to spray are dry and then spray the entire plant until it is wet, but not dripping.

Home PEST seeks to provide homeowners with the knowledge they need to make informed decisions about pesticides.

This publication is available from your county Cooperative Extension office.

The Home PEST project was developed by the University of Wisconsin-Extension Pesticide Applicator Training (PAT) program.

Any reference to pesticide products are for your convenience and are not an endorsement or criticism of one product over other similar products.

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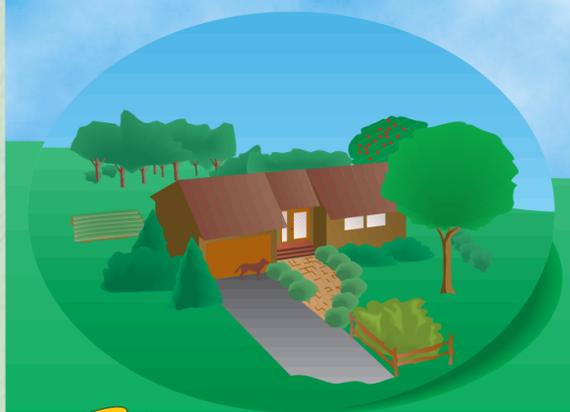
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## #8 - Hand Sprayer Calibration

# Calibrate a hand sprayer



## Home PEST

Home Pesticide Education & Safety Training  
University of Wisconsin-Extension

## What is Calibration?

Equipment calibration is a process that ensures that you are applying the correct amount of a pesticide uniformly over the target area. It involves adjusting your equipment as well as calculating its delivery rate (output). Improper calibration is often the cause of unsatisfactory pest control.

You should calibrate your equipment to:

- Make sure you apply the right amount of pesticide to control pests without the excessive pesticide residues or plant injury that over-applications cause.
- Ensure a uniform application by using properly adjusted and working equipment.
- Save money by buying only as much pesticide as you need.

This brochure will explain how to calibrate hand sprayers (see figure).



To find out how to calibrate a drop or rotary spreader, refer to Home PEST brochure #9, "Spreader Calibration."

## Using a hand sprayer

You can use hand sprayers to apply pesticides to your lawn, garden, trees, or shrubs.

### Advantages

- Good for spot treatments
- Easy to use

### Disadvantages

- Difficult to maintain uniform operating pressure
- Difficult to make uniform application because of changes in pressure and walking speed

### Before You Calibrate

Before you calibrate your hand sprayer, check that it is in proper working condition.

- Check all hose connections for leaks
- Replace all worn, leaky O-rings in the nozzle, trigger, and pump assembly
- Be sure the sprayer's cover gives a tight seal under pressure
- Use the correct nozzle for the intended application (check the label)
- Make sure that the nozzle opening is not worn, damaged, or partially plugged, which would distort the spray pattern.

The calibration procedure on the next panel is for a broadcast application ( a uniform application over the entire area) to areas such as lawns or gardens. When making spot applications (directed at individual plants or groups of plants), see Frequently Asked Questions later in this brochure.

## How to calibrate a hand sprayer for broadcast application

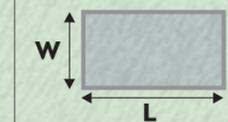
Follow these easy steps to calibrate your hand sprayer for lawn applications:

1. Measure a test area similar to the terrain you will be spraying. A minimum test area of 250 square feet (e.g., 10 feet by 25 feet) is suggested.
2. Fill the sprayer with water to a level that is easily recognized.
3. Spray the pre-measured area using the same nozzle, pressure, and walking speed that you will use when applying the pesticide. Be sure to move your wand evenly and consistently over the area.
4. Determine how much water it takes to refill the tank to the level in Step 2.
5. Multiply the volume from the previous step by 4 to get the volume of spray mixture you will need to spray 1000 square feet. Most labels express their rates per 1000 square feet.

Note: Check the label for the minimum volume to apply per 1000 square feet. If the volume in Step 5 is less than what the label specifies, the mix would be too concentrated and could harm your plants; repeat Steps 2-5 but decrease your walking speed in Step 3 to increase output.

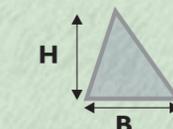
6. Determine the amount of pesticide needed for each gallon of water and for each tankful.
7. Determine the number of tankfuls and the total amount of pesticide you'll need to cover the intended area.

### Treatment area measurements



Rectangular areas

$$\text{Area} = \text{Length} \times \text{Width}$$



Triangular areas

$$\text{Area} = \frac{\text{Base} \times \text{Height}}{2}$$



Circular areas

$$\text{Area} = 3.14 \times \text{Radius}^2$$

### Conversions

3 teaspoons = 1 tablespoon = 1/2 ounce

8 tablespoons = 1/2 cup = 4 ounces

1 cup = 8 ounces

2 cups = 1 pint = 16 ounces

2 pints = 1 quart = 32 ounces

4 quarts = 1 gallon = 128 ounces

## Example

The product label recommends that 4 fluid ounces of herbicide be mixed in 2 to 4 gallons of water to cover 1000 square feet (sq ft). Your sprayer tank capacity is 1 1/2 gallons and your lawn is 10,000 sq ft. Follow the steps described earlier to calibrate your sprayer.

**Steps 1- 4:** In this example, you find that your sprayer delivered 3/4 gallon of water over 250 sq ft.

**Step 5:** What is the volume of application per 1000 sq ft based on the test area sprayed?  
(3/4 gallon per 250 sq ft) x 4 = 3 gallons per 1000 sq ft

**Step 6:** How many ounces of herbicide are needed per gallon of water and per tankful? The label requires 4 oz per 1000 sq ft and your sprayer delivers 3 gallons per 1000 sq ft. Thus:

4 oz ÷ 3 gallons = 1.33 oz herbicide per gallon

Multiply this amount by your tank capacity:  
1.33 oz/gallon x 1 1/2 gallon tank = 2 oz per tankful

**Step 7:** How many tankfuls, and how much pesticide, will you need to cover your lawn? From step 5 we know 3 gallons covers 1000 sq ft. From this, determine how much area one tankful will cover;

1000 sq ft ÷ 3 gallons = 333 sq ft per gallon  
333 sq ft x 1 1/2 gallon tank = 500 sq ft per tankful

Then, determine the total number of tankfuls needed:

10,000 sq ft lawn ÷ 500 sq ft per tankful = 20 tankfuls

The total amount of pesticide you'll need is:  
2 oz per tankful x 20 tankfuls = 40 oz (2 1/2 pints)  
This agrees with the label rate of 40 oz per 10,000 sq ft.