

HAND PESTICIDE APPLICATION CALIBRATION

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INTRODUCTION

Modern pesticide formulations need to be applied at very specific rates to obtain desired results and to minimize potential health or safety problems. Over or under application will result in less than desirable control of the target pest and increase the risk of causing problems. Especially with herbicides, this is **NOT** a case where “*if a little is good, a lot is better*”. Therefore, accurate application rates are a must for best results. Accuracy should be within 5% for best results.

Calibration is often presented with many mathematical calculations which tend to impress us only with the difficulty of the calibration process. In order to simplify the calibration process, this method has completed most of the math for you. This fact sheet is designed to be used with individual backpack or other hand carried application equipment, or nozzles, when applying emulsifiable concentrates or other liquid pesticide formulations.

Because each of us move at different speeds, have different application equipment, and we each have a different idea of what full coverage is, EACH person must calibrate their application equipment before we use hand sprayers for pesticide applications. This way, the pesticide mixture can be adjusted for individual differences and the appropriate pesticide application rate can be obtained.

FOLLOW THESE INSTRUCTIONS

1. Clean your sprayer thoroughly with soap and water, sudsy ammonia, or a commercial tank cleaner. Dispose of the rinse material properly. Make sure your application equipment is working properly. Fill sprayer full with clean water.
2. Measure an 18.5 foot x 18.5 foot spot in a typical weedy area. Spray this area uniformly with water and record the number of seconds it takes to evenly cover the area. Remember that consistency is vital to uniform coverage. Develop a smooth sweeping motion with the spray wand while you walk at a comfortable pace. Keep the pressure constant.
3. Spray water into a large container for the same length of time it took you to spray the plot in step 2. Be sure to maintain the same pressure used in step 2. Measure the fluid ounces you collect. If the product you are using is formulated at: 4 pounds active ingredient (a.i.) per gallon; the ounces of water collected for that specific time converts directly to gallons per acre of pesticide mixture to be applied, i.e. 30 ounces of water sprayed is equal to a rate of 30 gallons per acre.
4. The first three steps should be repeated twice more and the results averaged for accuracy.

5. To determine the amount of herbicide needed to mix in a gallon of water read the following chart. If the pesticide you are using is formulated at a rate different than 4 pounds (a.i.) per gallon you will need to do the additional math described at the bottom of the chart.

For example: Controlling a certain weed requires 3 quarts per acre of a 2,4-D product with 4 pounds a.i. per gallon. Your spray volume calculated above is 40 gallons per acre. According to the chart, you would mix 2.3 fluid ounces of 2,4-D per gallon of water to apply the correct amount of herbicide per acre. If your backpack sprayer holds 4 gallons of water then you would add 9.2 fluid ounces of 2,4-D to your sprayer tank. (2.3 fl oz times 4 = 9.2 fl oz. If needed, divide that out by using the handy conversions.)

*Chart: Volume of pesticide (4 lbs active ingredients per gallon) to mix in one gallon of water.**

| Spray Water Volume (Gallons per Acre) | Desired application rate of pesticide per acre | | | |
|--|--|-----------|-----------|------------|
| | 1 qt | 2 qts | 3 qts | 4 qts |
| 10 | 3.3 fl oz | 6.5 fl oz | 9.5 fl oz | 12.3 fl oz |
| 15 | 2.0 fl oz | 4.0 fl oz | 6.2 fl oz | 8.5 fl oz |
| 20 | 10.0 tsp | 3.2 fl oz | 4.8 fl oz | 6.3 fl oz |
| 30 | 6.0 tsp | 2.0 fl oz | 3.2 fl oz | 4.2 fl oz |
| 40 | 4.8 tsp | 1.6 fl oz | 2.3 fl oz | 3.2 fl oz |
| 50 | 3.8 tsp | 1.2 fl oz | 2.0 fl oz | 2.5 fl oz |
| 60 | 3.2 tsp | 6.3 tsp | 1.6 fl oz | 2.0 fl oz |
| 70 | 2.8 tsp | 5.5 tsp | 1.3 fl oz | 1.8 fl oz |
| 80 | 2.3 tsp | 4.8 tsp | 7.2 tsp | 9.5 tsp |
| 100 | 2.0 tsp | 3.8 tsp | 5.8 tsp | 7.6 tsp |

***This chart only applies to pesticides that have 4 pounds of active ingredients per gallon -- Read the label.** If the pesticide concentration you are using is different from 4 lb/gal a.i., then you will need to divide the pesticide mixture number (oz. or tsp.) in the chart by 4 and then multiply that answer by the number of pounds of a.i. per gallon listed on your product label. That quantity would then be mixed per gallon of water in your sprayer.

Handy conversions

| | | | |
|----------------|----------------------|---------------|---------------------------------|
| 3 teaspoons | = 1 tablespoon | 2 tablespoons | = 1 fluid ounce |
| 8 fluid ounces | = 1 cup | 1 cup | = 16 tablespoons |
| 2 cups | = 1 pint | 2 pints | = 1 quart |
| 4 quarts | = 1 gallon | 1 gallon | = 128 fluid ounces |
| 1 acre | = 43,560 square feet | 1 acre | = 128 18.5 ft. X 18.5 ft. Plots |