

UNIVERSITY OF NEVADA COOPERATIVE EXTENSION

A COUNTY–STATE–FEDERAL PARTNERSHIP

CALIBRATION OF YOUR FIELD SPRAYER

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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 tractor or pickup mounted application equipment, when applying emulsifiable concentrates or other liquid pesticide formulations.

Because of various field conditions, different application equipment, and different speeds crossing a field, EACH person must calibrate their application equipment before we use sprayers for pesticide applications. This way, the pesticide mixture can be adjusted for individual and field 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 all of the equipment is working properly. Fill sprayer with clean water.
2. Measure a specific distance such as 88, 100, 200, or 300 feet in a typical area of the field you will be spraying. If using a tractor, set your tractor RPM and select a gear which will be used in that field. If using a truck decide upon a gear and speed that will be used. Spray the measured distance from a running start at the specified speed or RPM. Record the time needed to cover that distance.
3. Place a measured container under each nozzle to collect the spray. Turn on the spray bar the same length of time it took to spray the distance in step 2. Because of variability between nozzles it is best if each nozzle is collected separately. Record the amount collected in each container, and add them together. Divide the total by the number of nozzles to get an average spray quantity per nozzle. If any nozzle sprays 10% over or under the average clean it, or replace it, and repeat step 3.
4. The total amount collected in step 3 is converted to gallons per acre. Do this by multiplying the distance originally measured (traveled) by the width of the spray pattern to

obtain the area of the plot sprayed. Divide the area of the plot sprayed by 43,560 (number of square feet in an acre) to obtain the fraction of an acre sprayed. Now you know the plot area sprayed and the liquid volume sprayed on the plot. Divide the area into the quantity of liquid to obtain the number of gallons of water applied per acre.

- To determine the amount of pesticide you need to mix in a gallon of water read the chart below. You only need to do additional math if the pesticide you are using is formulated at a rate different than 4 pounds active ingredient (a.i.) per gallon.

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 tank holds 100 gallons of water then you would add 1 gallon, 3 quarts, and 6 fl. Ounces of 2,4-D to your 100 gallon sprayer tank. (2.3 fl oz times 100 = 230 fl oz. 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 than 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
8 fluid ounces	= 1 cup
2 cups	= 1 pint
4 quarts	= 1 gallon
1 acre	= 43,560 square feet

2 tablespoons	= 1 fluid ounce
1 cup	= 16 tablespoons
2 pints	= 1 quart
1 gallon	= 128 fluid ounces