

Easy Math, 128th Acre Broadcast Sprayer Calibration

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Step 1	Measure out the 128 th of an acre calibration area. Suggested sizes are: 10' by 34', 13' by 26', 15' by 22.5' or 18.5' by 18.5'
Step 2	Total volume of your herbicide spray tank in gallons. Tank Size = _____ (gal) Put this value in Step 2 below. Typical tank sizes are 4 gallons for a backpack, 15, 20, 50 gal. or larger for skid sprayers
Step 3	Spray the 128 th of an acre calibration area evenly while recording the amount of time to spray. Enter the time here = _____ (seconds)
Step 4	Spray water into a bucket for the same amount of time as in Step 3. Measure the water in the bucket in ounces. This will equal the gallons per acre (GPA) that the sprayer is applying. Ounces in bucket = _____ GPA Put this value in Step 4 in the formula below.
Step 5	Divide Step 2 by Step 4 below, this will determine the number of acres sprayed per tank load. Enter this number in the box labeled Step 5 below. Note: This value may be less than 1 for most backpack or small sprayers.
	Herbicide Rate Calculation
Step 6	Re-enter the number of acres per tank load from Step 5 one more time on the last line. Note: you will have entered the same number for Step 5 in two places
Step 7	From the herbicide label, determine the amount of herbicide product to be applied per acre in ounces. Put this value in Step 7 below.
Step 8	Multiply Step 5 times Step 7, this will determine the amount of herbicide to be added to each tank load.

$$\text{Step 2 } \frac{\text{_____}}{\text{(spray tank volume)}} \div \text{Step 4 } \frac{\text{_____}}{\text{(GPA)}} = \text{Step 5 } \frac{\text{_____}}{\text{(acres per tank load)}}$$

Herbicide Rate Calculation

$$\text{Step 5 } \frac{\text{_____}}{\text{(acres per tank load)}} \times \text{Step 7 } \frac{\text{_____}}{\text{(oz herbicide per acre)}} = \text{Step 8 } \frac{\text{_____}}{\text{(herbicide per tank load in oz.)}}$$

- Notes:** 1. This works for both liquid and dry herbicides measured in ounces. (1 gallon = 128 oz, 1 quart = 32 oz, 1 pint = 16 oz.)
2. If the area to be sprayed is less than the area that a full tank load will spray (for example, site is 0.02 ac. and tank can spray 0.1 ac), reduce the amount of water and herbicide by the same proportion as the reduction in area to be sprayed. (1 acre = 43,560 square feet.)
3. Each applicator should do their own calibration and spray mixing.
4. Surfactants are usually added to the spray mix on a percent volume basis. Multiply the recommended percentage by 128 to determine ounces per gallon of mix. For example, 0.5% surfactant X 128 = 0.64 oz. per gallon mix. It's OK to round to the nearest ounce, if you are not adding more than the surfactant label allows. Do not apply more pesticide than the label allows.

Instructions for Easy Math, 128th Acre Broadcast Sprayer Calibration

Step 1 – Measure out an 128th acre area (340 sq. ft.). Common areas are listed in the table above.

Step 2 – Enter the size of your spray tank in gallons in the space provided. Then enter it again below in Step 2 of the math equation. If you are only going to partially fill the tank, this worksheet will also calculate the amount of herbicide to add to the tank (for example, if filling 7 gallons of mix in a 20-gallon tank, enter 7 gallons).

Step 3 – After spraying the 128th of an acre calibration area, enter the time in seconds, on the space provided, it took to evenly spray the area.

Step 4 – Spray water into a bucket or large measuring device for the same amount of time it took to spray the 128th of an acre calibration area. Measure the ounces of water in the bucket, record this on the space provided and enter it again below in the math equation in Step 4. The output of water in the bucket will equal your spray rate in gallons per acre (GPA). There are 128 ounces in a gallon, and you sprayed 128th of an acre, so each ounce of water equals 1 gallon per acre (for example 68 ozs. of water in bucket = 68 GPA spray rate). Note: The spray rate is not the herbicide rate, but the total volume of mix (herbicide, surfactant and water) applied.

Step 5 – In the math equation, divide the value you entered in step 2 by step 4. Enter this value in the math equation on the first line. Step 5 calculates the number of acres your tank will be able to treat in one tank load. For most small tanks (like 4-gallon backpack sprayers), this value will be much smaller than 1 acre. Large tanks may treat several acres. This value will still work if you partially fill up your tank (such as 7 gallons of water in a 20-gallon sprayer).

Step 6 – Re-enter the value you entered in step 5 on the second line of the math equation. You will have entered the value you calculated in Step 5 twice, once on the first line and a second time on the second line. This value will be the same in both lines.

Step 7- The herbicide label will list a rate of product to apply per acre. Enter this value in ounces in Step 7 on the math equation. Always use the rate per acre in ounces for Step 7. A percent solution is not an herbicide rate. The herbicide rates (usually in ounces per acre) vary widely between herbicides. Some products are applied at 1 ounce per acre, others may be more than 80 ounces per acre. If the herbicide rate on the label is in pints, multiply the pints per acre by 16 (there are 16 ounces per pint). If the herbicide rate on the label is in quarts, multiple the quarts per acre by 32 (there are 32 ounces per quart). If the label only lists herbicide rates per 1,000 square feet, convert to ounces if in tablespoons (multiple tablespoons by 0.5 to get ounces) and then multiply the 1,000 sq. ft. rate in ounces by 43.56 (there are 43,560 square feet in one acre), however using the herbicide rate per acre is recommended.

Step 8 –Multiply the value from Step 5 by Step 7 to obtain the amount of herbicide in ounces to add to your tank. Following the herbicide label instructions, you can now fill up your tank with the appropriate amount of water (from Step 2) and the appropriate amount of herbicide (Step 8). See Note #4 on the first page for adding surfactants. Spray the weeds as you did during when spraying the 128th of an acre. Re-calibrate when changing nozzles, pressure, or equipment, or when working on different terrain or at a different speed.