

Calibrating Sprayer Output to Calculate the Dilution of an Herbicide (such as Milestone for Japanese Knotweed Treatment, to achieve a fixed number of ounces per acre application rate) - Leslie Kuhn, Mid-Michigan Stewardship Initiative

The goal here is to assess the volume of spray per acre that a given person will apply using a given device with a given nozzle setting. It is important to know this to calculate the amount of Milestone herbicide to dilute into 1 gal of water, because Milestone is potent in a small amount, and herbicide application rates of different people using different sprayers can vary by 3-fold or more.

1. Completely empty your sprayer of any herbicide (including spraying out any fluid remaining in the reservoir/hose).
2. Measure off an area of your driveway or other rectangular, fixed area in square feet (say, a 20' X 50' area = 1000 sq. ft., or some other convenient square patch)
3. Add 1 gallon of water to your sprayer, and adjust your nozzle as you like it for foliar spraying. Mark your nozzle at that setting and don't change it.
4. Spray the entire area you measured out, applying the water as though you were spraying Japanese knotweed on the pavement surface. You may need to make one or more additional or partial passes of your measured-out area to empty your sprayer completely. Mark where you stopped.
5. Calculate the total number of square feet you covered with 1 gal spray solution (water, in this case). For instance, if you sprayed your 1,000 sq. ft. patch once and ran out of spray after you had covered an additional 50 sq. ft. (early in your second pass), you would have applied 1 gal of spray to 1,050 sq. ft.
6. From this number, calculate your spray rate in gallons per acre, G. Note: 1 acre = 43,560 sq. ft.

$$\frac{G}{43,560 \text{ sq. ft.}} = \frac{1 \text{ gallon}}{1,050 \text{ sq. ft.}}$$

Thus, $G = (43,560 \text{ sq. ft.} * 1 \text{ gallon})$ divided by $(1,050 \text{ sq. ft.}) = 41.5 \text{ gal/acre}$ for this hypothetical person + sprayer combination.

A typical person with a backpack sprayer will come up with a number between 35 and 75 gal/acre

7. Now, calculate the amount of Milestone to add per gallon water, with the target of spraying 6 oz./acre. To apply 6 oz. of Milestone per acre, the hypothetical person above would add 6 oz. of Milestone to 41.5 gal of water. Dividing 6 oz. by 41.5 gal results in adding 0.145 oz of Milestone to 1 gal of water. Less than 1 oz is hard to measure with normal utensils, so we will convert it to cc (cubic centimeters; same as milliliters), which can be measured by a plastic syringe without a needle*.

1 oz = 29.6 cc, so 0.145 oz = 4.3 cc Milestone. In other words, add 4.3 cc Milestone per 1 gal water. Make sure to use your own "gallons per acre" number from (6) in this calculation.

8. Don't forget to add the adjuvant! It is needed to allow the herbicide to stick to and penetrate the leaves. 0.5% Cygnet Plus means adding 0.6 oz of Cygnet Plus to each 1 gal of spray solution.

9. Now, go spray some Japanese knotweed!



*Pharmacies and pet supply companies carry 5cc and 10cc plastic syringes, which can be rinsed immediately after herbicide measuring and reused many times. Remove any needle that comes attached, and dispose of it safely.