



The University of Georgia

College of Agricultural & Environmental Sciences

Spraying Solutions Other Than Water

Paul E. Sumner
Extension Engineer

The diluting agent for most spray applications is water. However, your situation may require using liquid fertilizer or another type of liquid. You must know what diluting agent you will use before you can select the appropriate nozzles for the job.

Use water when calibrating a sprayer to apply a liquid other than water. Most nozzle selection charts provided by the manufacturers are based on spraying with water, the figures will not be correct if you are using liquid fertilizer or another type liquid. Table 1 is provided to help you adjust the figures to fit your situation. Most nozzle manufacturer's catalogs provide this chart as well.

For selecting a nozzle, multiply the values on the nozzle charts by the conversion factor from the table to determine the correct value for the solution being sprayed.

Table 1. Conversion Factors for Solutions other than Water.

Weight of Solution (lbs/gal.)	Specific Gravity	Conversion Factor
6.6 (kerosene)	0.79	0.89
7.0	0.84	0.92
8.0	0.96	0.98
8.34 (water)	1.00	1.00
9.0	1.08	1.04
10.0	1.20	1.10
10.65 (28% N)	1.28	1.13
11.0	1.32	1.15
12.0	1.44	1.20
14.0	1.68	1.30
16.0	1.92	1.39

To calculate a conversion factor for a weight of solution not indicated in Table 1.

1. Determine the weight of solution (pounds per gallon). Measure out a gallon of material in a container. Weigh the container plus material in pounds. Subtract the weight of the container. Your supply dealer can also provide this information.

2. Determine the specific gravity (SG) of the solution. Divide the weight of solution/gallon by the weight of water/gallon.

$$SG = \frac{\text{Weight of Solution (lbs / gal.)}}{8.34}$$

3. Next, calculate the conversion factor by taking the square root of the specific gravity.

$$\text{Conversion Factor} = \sqrt{SG}$$

For calibrating a sprayer, divide the values on the nozzle charts by the conversion factor from the table to determine the correct value for the solution being sprayed

Example: You have calibrated a sprayer with water. It has a rate of application of 22 GPA_(water) at 30 psi. You plan to apply 28% nitrogen fertilizer solution. The actual rate of application (28% Nitrogen) is

$$GPA_{(Solution)} = \frac{GPA_{(Water)}}{\text{Conversion Factor}}$$

$$GPA_{(28\%Nitrogen)} = \frac{22 GPA_{(Water)}}{1.13(\text{Conversion Factor})} = 19.5$$

Determine Actual Product rate (lbs/acre).

$$\text{lbs per acre} = \frac{GPA_{(Solution)} \times \% \text{ Product} \times \text{Weight of Solution}}{100}$$

$$\text{lbs per acre} = \frac{19.5 GPA_{(28\%Nitrogen)} \times 28(\%N) \times 10.65(\text{Weight of Solution})}{100} = 58.1 \text{ units of N}$$

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