## Determine Amount of Pesticide to Use

*Your 300-gallon sprayer has been calibrated to apply 15 GPA. The pesticide label says to apply 32 fluid ounces (1 quart) of product per acre for broadcast application. How much pesticide will you add to the tank to spray 20 acres? 1 gallon = 128 fluid ounces*

First, find the number of acres each tank will spray:

<u>300 gallons</u>   X   <u>1 acre</u>      =   <u>20 acres</u>
   1 tank          15 gallons        1 tank

That means that 1 tank will be enough to spray the field.

Next, find out the number of fluid ounces of pesticide product to add to the tank:

<u>32 fluid ounces</u>     X         <u>1 gallon</u>      X   20 acres   =   5 gallons of pesticide product
   1 acre                   128 fluid ounces

The final mix consists of 5 gallons of pesticide product and 295 gallons of water per 300 gallons of tankful. 300 gallons of total spray mix – 5 gallons of pesticide product = 295 gallons of water

**Practice**

1.  *You are going to apply with a 500-gallon sprayer that has been calibrated to apply 20 gallons per acre. The 40-acre field will be treated with a pesticide at a rate of 8 fluid ounces per acre. How much pesticide will be needed (in gallons), and how much water?*

2.  *You need to apply a pesticide at the rate of 2.7 quarts per acre, in a minimum of 10 gallons per acre of water for ground application. You have a 500-gallon sprayer that has been calibrated to apply 20 gallons per acre, and want to treat 10 acres. 1 gallon = 4 quarts.*

3. *When calibrating your sprayer, you found it delivers 2 gallons of water per 250 square feet of test area. You have an area that is 40 feet by 300 feet that needs to have an herbicide applied, at a rate of 4 fluid ounces of product per 1,000 square feet. How many gallons of water and product combined will be needed to treat the area, and how many ounces of formulation do you need to cover the area? You have a small 100-gallon tank for spot treatments such as these.*

**Answers**

1. *You are going to apply with a 500-gallon sprayer that has been calibrated to apply 20 gallons per acre. The 40-acre field will be treated with a pesticide at a rate of 8 fluid ounces per acre. How much pesticide will be needed (in gallons), and how much water?*

First, how many acres will 1 tank cover at that rate?

$$\frac{500 \text{ gallons}}{1 \text{ tank}} \times \frac{1 \text{ acre}}{20 \text{ gallons}} = \frac{25 \text{ acres}}{1 \text{ tank}}$$

You will need more than one tank to treat 40 acres. One tank full to treat 25 acres, and a partial tank to treat 15 acres

40 acres – 25 acres = 15 acres.

$$\frac{25 \text{ acres}}{1 \text{ tank}} \times \frac{8 \text{ fluid ounces}}{1 \text{ acre}} \times \frac{1 \text{ gallon}}{128 \text{ fluid ounces}} = 1.5625 \text{ gal of product for full tank}$$

500 gallons of pesticide solution – 1.6 gallons of product = 498.4 gallons of water

$$\frac{15 \text{ acres}}{1 \text{ tank}} \times \frac{8 \text{ fluid ounces}}{1 \text{ acre}} \times \frac{1 \text{ gallon}}{128 \text{ fluid ounces}} = 0.9375 \text{ gallons of product for second (partial) tank}$$

To determine how much water and pesticide product for the partial tank, multiply the number of acres to treat by the rate the sprayer was calibrated to spray.

15 acres X $\frac{20 \text{ gallons}}{1 \text{ acre}}$ = 300 gallons

300 gallons of pesticide solution – 0.9375 gallons of product = 299 gallons of water

**2.** *You need to apply a pesticide at the rate of 2.7 quarts per acre, in a minimum of 10 gallons per acre of water for ground application. You have a 500-gallon sprayer that has been calibrated to apply 20 gallons per acre, and want to treat 10 acres. 1 gallon = 4 quarts.*

*How much pesticide product will you need?*

10 acres X   2.7 quarts   X   1 gallon    =    6.75 gallons of product
           1 acre         4 quarts

*What is the total volume of spray needed?*

20 gallons    X    10 acres    =    200 gallons of spray mixture
   1 acre

*How many gallons of water will you need?*

200 gallons of spray mixture – 6.75 gallons of product = 193.25 gallons of water.

**3.** *When calibrating your sprayer, you found it delivers 2 gallons of water per 250 square feet of test area. You have an area that is 40 feet by 300 feet that needs to have an herbicide applied, at a rate of 4 fluid ounces of product per 1,000 square feet. How many gallons of water and product combined will be needed to treat the area, and how many ounces of formulation do you need to cover the area? You have a small 100-gallon tank for spot treatments such as these.*

Determine how many square feet need treatment.

40 ft. X 300 ft. = 12,000 sq. ft.

This is 12 times larger than our 1,000 sq ft area given in the application rate (4 fl oz per 1,000 sq ft.)

12,000 sq. ft.   =    12
1,000 sq. ft.

If the sprayer delivers 2 gallons per 250 sq ft, it delivers 8 gallons per 1,000 sq ft. (divide 1,000 sq ft by 250 sq ft to get 4. Then multiply 2 gallons by 4 to get 8 gallons per 1,000 ft.).

1,000 sq. ft.    = 4
 250 sq. ft.

4    X     2 gal per 250 sq. ft. = 8 gal pesticide spray solution per 1,000 sq. ft.

Using our multiplier of 12, we know that the sprayer will have to deliver 96 gallons to cover the 12,000 square foot area.

8 gallons per 1,000 sq. ft. X 12 = 96 gallons pesticide spray solution

You want to apply 4 fluid ounces of product per 1,000 square feet, and need to cover 12,000 square feet. Again, this is 12 times what was listed in the application rate. You will have to use 48 ounces of product.

4 fluid ounces of pesticide per 1,000 sq. f.t X 12 = 48 fluid ounces of pesticide.