

RIGHT OF WAY PEST CONTROL
Practice Problems Direct from MANUAL

CALCULATIONS

The formulas below may be needed in the following mixing and calibration problems:

$\text{speed (mph)} = \frac{\text{distance (feet)} \times 60}{\text{time (seconds)} \times 88}$ <p align="center">(1 mph = 88 feet in 60 seconds)</p>	$\text{gpm} = \frac{\text{gpa} \times \text{mph} \times \text{w}}{495}$
$\text{gpm} = \frac{\text{Ounces per minute}}{128 \text{ ounces per gallon}}$	$\text{gpa} = \frac{\text{gpm} \times 495}{\text{mph} \times \text{w}}$
$\text{Acres tank will spray} = \frac{\text{Tank capacity in gallons}}{\text{Application rate in gallons per acre}}$	$\text{Pounds of product to apply per acre} = \frac{\text{Pounds of a.i. per acre}}{\text{Percent a.i.}}$
<p>(Liquid)</p> $\text{Ounces product per 1000 sq. ft.} = \frac{\text{Quart product per acre} \times 32 \text{ ounces per quart} \times 1000 \text{ square feet}}{43,560 \text{ square feet per acre}}$	
<p>(Dry)</p> $\text{Ounces product per 1000 sq. ft.} = \frac{\text{Pounds product per acre} \times 16 \text{ ounces per pound} \times 1000 \text{ square feet}}{43,560 \text{ square feet per acre}}$	
$\text{Area} = \text{length (L)} \times \text{width (W)}$	
$\text{Dry Weight} \quad 1 \text{ pound} = 16 \text{ ounces}$	

- To increase the flow rate of a nozzle from 0.3 gallons per minute at 20 pounds per square inch to 0.6 gallons per minute, pressure must be increased to _____ pounds per square inch.
Page 35

- If a sprayer applying 20 gallons per acre at 3 miles per hour increases it's speed to 6 miles per hour with the pressure remaining constant, how many gallons are being applied per acre?
Page 35

- If 40 gallons per acre are being applied in a 8-foot swath and the boom is raised to cover a 16-foot swath with everything else remaining constant, how many gallons per acre are being applied? **Page 35**

4. If a 200-foot course is measured and an average of 22 seconds is required to make a pass, what is the ground speed in miles per hour? **Page 37**

5. Calculate the flow rate in gallons per minute of a single swivel nozzle used to broadcast a herbicide at an application rate of 30 gallons per acre if the speed of the sprayer is 6 miles per hour and the nozzle spray width is 20 feet. **Page 38**

6. A herbicide label recommends an application rate of 20 to 40 gallons per acre. A 25 pounds per square inch operating pressure, 6 miles per hour ground speed and a 20 foot nozzle spray width were selected. If 960 ounces of water were collected from the nozzle in 1 minute, calculate the nozzle flow rate in gallons per minute. **Page 40**

7. With the information given in Question 6 above, calculate the application rate in gallons per acre. **Page 40**

8. If a herbicide label calls for 6 pounds active ingredient per acre and a 80% wettable powder is used, how much of the formulated product should be used per acre? **Page 45-46**

9. A sprayer with a tank capacity of 400 gallons is calibrated for an application rate of 30 gallons per acre. An 80% wettable powder herbicide is to be applied. The label recommends applying 6 pounds of active ingredient per acre. How many pounds of herbicide product (i.e. the 85WP) should be added to the spray tank? **Page 45-46**
10. A 3-gallon backpack sprayer has been calibrated to apply 1.25 gallon per 1000 square feet of area. Using 30 pounds of active ingredient per acre, how many ounces of the formulated product (90 % a.i.) will be needed per 1000 square feet? **Page 46-47**
11. How much adjuvant should be added to 300 gallons of herbicide mixture if the adjuvant is used at 0.50 percent concentration by volume? **Page 49-50**
12. A fence next to the road is 1 mile long (5280 feet) and needs herbicide sprayed in a 1.5 foot band on the inside and a 1.5 foot band on the outside of the fence. How many square feet will be treated? How many acres is this ? **Page 50**

ANSWERS:

- | | | |
|--------------|----------------|--------------------------------|
| 1. 80 psi | 2. 10 GPA | 3. 20 GPA |
| 4. 6.2 MPH | 5. 7.3 GPM | 6. 7.5 GPM |
| 7. 30.9 GPA | 8. 7.5 pounds | 9. ~100 lbs |
| 10. 12.24 oz | 11. 1.5 gallon | 12. 15,840 sq. ft.
(0364 A) |

RIGHT OF WAY PEST CONTROL

Practice Problems

CALCULATIONS

The formulas below may be needed in the following mixing and calibration problems:

$\text{speed (mph)} = \frac{\text{distance (feet)} \times 60}{\text{time (seconds)} \times 88}$ <p style="text-align: center;">(1 mph = 88 feet in 60 seconds)</p>	$\text{gpm} = \frac{\text{gpa} \times \text{mph} \times \text{w}}{495}$
$\text{gpm} = \frac{\text{Ounces per minute}}{128 \text{ ounces per gallon}}$	$\text{gpa} = \frac{\text{gpm} \times 495}{\text{mph} \times \text{w}}$
$\text{Acres tank will spray} = \frac{\text{Tank capacity in gallons}}{\text{Application rate in gallons per acre}}$	$\text{Pounds of product to apply per acre} = \frac{\text{Pounds of a.i. per acre}}{\text{Percent a.i.}}$
<p>(Liquid)</p> $\text{Ounces product per 1000 sq. ft.} = \frac{\text{Quart product per acre} \times 32 \text{ ounces per quart} \times 1000 \text{ square feet}}{43,560 \text{ square feet per acre}}$	
<p>(Dry)</p> $\text{Ounces product per 1000 sq. ft.} = \frac{\text{Pounds product per acre} \times 16 \text{ ounces per pound} \times 1000 \text{ square feet}}{43,560 \text{ square feet per acre}}$	
$\text{Area} = \text{length (L)} \times \text{width (W)}$	
$\text{Dry Weight} \quad 1 \text{ pound} = 16 \text{ ounces}$	

1. To decrease the flow rate of a nozzle from 0.4 gallons per minute at 40 pounds per square inch to 0.3 gallons per minute, pressure must be decreased to _____ pounds per square inch.
Page 35

2. If a sprayer applying 20 gallons per acre at 5 miles per hour decreases its speed to 3 miles per hour with the pressure remaining constant, how many gallons are being applied per acre?
Page 35

3. If 30 gallons per acre are being applied in a 6-foot swath and the boom is raised to cover a 9-foot swath with everything else remaining constant, how many gallons per acre are being applied?
Page 35

4. If a 308-foot course is measured and an average of 70 seconds is required to make a pass, what is the ground speed in miles per hour? **Page 37**

5. Calculate the flow rate in gallons per minute of a single swivel nozzle used to broadcast a herbicide at an application rate of 30 gallons per acre if the speed of the sprayer is 5 miles per hour and the nozzle spray width is 30 feet. **Page 38**

6. A herbicide label recommends an application rate of 15 to 25 gallons per acre. A 25 pounds per square inch operating pressure, 4 miles per hour ground speed and a 25 foot nozzle spray width were selected. If 768 ounces of water were collected from the nozzle in 1 minute, calculate the nozzle flow rate in gallons per minute. **Page 40**

7. With the information given in Question 6 above, calculate the application rate in gallons per acre. **Page 40**

8. If a herbicide label calls for 3 pounds active ingredient per acre and a 75% wettable powder is used, how much of the formulated product should be used per acre? **Page 45-46**

9. A sprayer with a tank capacity of 300 gallons is calibrated for an application rate of 30 gallons per acre. An 85% wettable powder herbicide is to be applied. The label recommends applying 3 pounds of active ingredient per acre. How many pounds of herbicide product (i.e. the 85WP) should be added to the spray tank? **Page 45-46**
10. A 4-gallon backpack sprayer has been calibrated to apply 1 gallon per 1000 square feet of area. Using a Wettable Powder with 50% active ingredient at 10 pounds of active ingredient per acre, how many ounces of the formulated product will be needed per 1000 square feet? **Page 46-47**
11. How much adjuvant should be added to 400 gallons of herbicide mixture if the adjuvant is used at 0.25 percent concentration by volume? **Page 49-50**
12. A fenced yard that is 200 feet wide and 500 feet long needs a 1 foot band on the inside and a 1 foot band on the outside of the fence. How many square feet will be treated? **Page 50**

ANSWERS:

- | | | |
|-------------|----------------|------------------|
| 1. 22.5 psi | 2. 33.3 GPA | 3. 20 GPA |
| 4. 3 MPH | 5. 9.09 GPM | 6. 6.0 GPM |
| 7. 29.7 GPA | 8. 4.0 pounds | 9. 35.3 lbs |
| 10. 7.35 oz | 11. 1.0 gallon | 12. 2800 sq. ft. |

More Practice from the Calibration Problem Set

Problem type above	Similar Problem in Calibration Set
1.	1, 21
2.	7, 20
3.	19
4.	6, 16, 27, 34
5.	12
6.	8, 9, 18
7.	
8.	3, 17, 36
9.	11, 22, 23, 24, 32, 38
10.	4, 14, 35
11.	2, 15
12.	5, 11, 13