

Appendix: Useful Formulas

Formulas for Pesticide Needs and Mixing Calculations

Total Formulation Needed:

$$\text{Total needed} = \text{rate formulation per acre} \times \text{acres to spray}$$

Total Water Needed:

$$\text{Total gallons of water needed} = \text{Acres to treat} \times \text{GPA (gallons per acre of sprayer)}$$

Formulation per gallon of water:

$$\text{Formulation per gallon of water} = \frac{\text{Total formulation needed}}{\text{Total Water}}$$

Quantity of Formulation to add to Tank

$$\text{Formulation to add to Tank} = \text{formulation per gallon} \times \text{gallons water in tank}$$

Number of Full Tanks to Spray Entire Area

$$\text{Total Water Needed} / \text{Gallons in Sprayer Tank}$$

Amount of Water in Last Tank

A) Portion of Tank = (Total Number of Tanks – whole number)
[For example 2.74 tanks – 2 = 0.74 tanks]
[This number always starts with a zero]

B) Amount of Water in last Tank = Portion of Tank \times Size of Tank (in gallons)

$$\text{Amount of Formulation in Last Tank} = \text{Amount of water in last tank} \times \text{formulation per gallon of water}$$

$$\underline{1 \text{ gallon} = 4 \text{ quarts} = 8 \text{ pints} = 128 \text{ fl.oz.}}$$

Formulas: Flow Rate Calibration Method

$$\text{Gallons per minute (GPM)} = \frac{\text{ounces collected} / 128}{\text{Minutes}}$$

$$\text{Width of one nozzle in inches} = \frac{\text{width of boom in ft.} \times 12 \text{ inches per foot}}{\text{Number of nozzles}}$$

$$\text{MPH} = \frac{60}{88} \times \frac{\text{calibration distance (ft)}}{\text{calibration time (sec)}}$$

$$\text{GPA} = \frac{\text{GPM}}{\text{MPH}} \times \frac{5940}{\text{spray width of one nozzle (inches)}}$$

Formulas: Refill Calibration Method

$$\text{Gallons of Water Used} = \text{Gallons at start} - \text{Gallons remaining}$$

$$\text{Gallons per Acre (GPA)} = \frac{\text{Gallons Used}}{\text{Distance (ft)}} \times \frac{43560}{\text{Spray Width of whole sprayer}}$$