Appendix: Useful Formulas

Formulas for Pesticide Needs and Mixing Calculations

Total Formulation Needed:

Total needed = rate formulation per acre X acres to spray

Total Water Needed:

Total gallons of water needed =
Acres to treat X 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

Formulation to add to Tank = formulation per gallon X gallons water in tank

Number of Full Tanks to Spray Entire Area

Total Water Needed / 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 X Size of Tank (in gallons)

Amount of Formulation in Last Tank = Amount of water in last tank X formulation per gallon of water

1 gallon = 4 quarts = 8 pints = 128 fl.oz.

Formulas: Flow Rate Calibration Method

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

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

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

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

Formulas: Refill Calibration Method

Gallons of Water Used = Gallons at start – Gallons remaining

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