Sprayer Calibration and Application Basics

Why calibrate?

- Proper calibration is important to assure successful application of pesticides
- Avoid wasting materials and money
- Avoid poor pest control and turf injury

Sprayer Calibration depends on:

- The sprayer's forward speed
- The pressure at the nozzle
- The size of the nozzles
- The spacing of the nozzles on the boom

Nozzles

- Flat fans are most common in turfgrass applications due to crop uniformity
- Commonly used nozzles have spray angles ranging from 65° to 120°
- Manufacturers typically code their nozzles with a numbering system to indicate spray angle and output
  - Example: 8004
  - 80 degree spray angle
  - 0.4 gallons per minute output at 40psi

Calibration Formulas

- $$\text{speed } (mph) = \frac{\text{distance traveled (ft)} \times 60}{\text{time (sec) to travel distance} \times 88}$$

- $$gpa = \frac{gpm \text{ per nozzle} \times 5{,}940}{mph \times \text{nozzle spacing (inches)}}$$

Sprayer Calibration Supplies

- Catch can
- Tape Measure
- Stopwatch
- Flags/paint
- Sprayer

Sprayer Calibration

- Step One: determine sprayer speed
  - Record time (in seconds) needed to travel 100 ft with sprayer in a specific gear and at a specific RPM
  - $$\text{speed } (mph) = \frac{\text{distance traveled (ft)} \times 60}{\text{time (sec) to travel distance} \times 88}$$
  - Example: a sprayer takes 20 seconds to travel 100 feet. What is the mph of the sprayer?

Answer: 3.41 mph

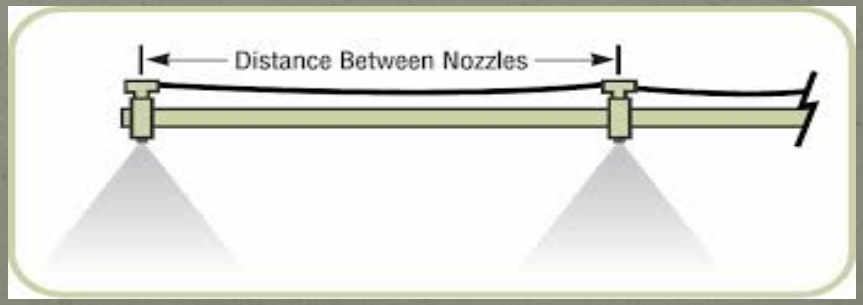
Sprayer Calibration

- Step Two: determine gpm for one nozzle
  - Set engine RPM to same RPM as in step one
  - Using a one gallon catch can, catch volumetric output from one nozzle for 30 seconds
  - $$gpm = \frac{(\text{ounces per nozzle in 30 seconds*}) \times 2}{128}$$
  - Example: if the average volume caught from one nozzle in 30 seconds is 40 ounces, what is the gpm?

Answer: 0.625 gpm

Sprayer Calibration

- Step Three: determine NSI
  - NSI (nozzle spacing in inches) is the distance between two nozzle tips
  - Using a tape measure, determine the NSI from one nozzle tip to another nozzle tip
  - Example: 20 inches



Sprayer Calibration

- Step Four: solve for GPA
  - $$gpa = \frac{gpm \text{ per nozzle} \times 5{,}940}{mph \times \text{nozzle spacing (inches)}}$$
  - Example:
    - mph was 3.41
    - gpm was 0.625
    - NSI was 20 inches
    - What is GPA?
    - Answer: 54.4 GPA

Sprayer Calibration Example

- Example: A sprayer takes 22 seconds to travel 100 feet in second gear at 2300 RPM. 28 oz of water is caught from one nozzle in 30 seconds at 2300 RPM at 40 psi. The distance between nozzles measures 18 inches. What is the GPA of the sprayer?

Answer: 46.6 GPA