CALIBRATING TURF GRASS SPRAYERS (Gallons per 1000 sq ft)

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Low-pressure boom sprayers are used frequently for applying chemicals on large areas such as golf courses and recreational areas. Application rates for turf are normally given in gallons per 1000 sq ft. Calibrating a boom sprayer is not as difficult as it sounds. Calibrate your sprayer often to compensate for nozzle wear, pump wear and speed changes.

Calibrate with clean water. Check uniformity of nozzle output across the boom. Collect from each for a known time period. Each nozzle should be within 10 percent of the average output. Replace with new nozzles if necessary. When applying materials that are appreciably different from water in weight or flow characteristics, such as fertilizer solutions, etc., calibrate with the material to be applied. Exercise extreme care and use protective equipment when active ingredient is involved.

**Step 1. Determine the Effective Swath Width (W) per Nozzle**
For boom spraying, the effective spray width of each nozzle (W) is equal to the distance in inches between two nozzles.

**Step 2: Determine Travel Speed (MPH)**
To determine the travel speed, measure a known distance. Use fence posts or flags to identify this distance. A distance over 200 feet and a tank at least half full are recommended. Travel the distance determined at your normal spraying speed and record the elapsed time in seconds. Repeat this step and take the average of the two measurements. Use the following equation to determine the travel speed in miles per hour:

$$\text{Travel Speed (MPH)} = \frac{\text{Distance (feet)} \times 0.68}{\text{Time (seconds)}}$$

(0.68 is a constant to convert feet/second to miles/hour)

**Step 3. Determine Nozzle Flow Rate (GPM)**
With the sprayer parked, operate the sprayer at the same pressure level and catch the output from each nozzle in a measuring jar for one minute (or collect output for half a minute and then double the ounces collected) to determine the nozzle flow rate in ounces per minute (OPM) Then, convert the final average output in OPM to gallons per minute (GPM) using the following equation:

$$GPM = \frac{OPM}{128}$$

(1 Gallon = 128 ounces)

**Step 4. Determine the Actual Application Rate in Gallons per Gal/1000 sq ft**
Use the following equation to determine the gallons per acre application rate:

$$\text{Gallons per 1000 sq.ft.} = \frac{136 \times GPM_{\text{per nozzle}}}{MPH \times W}$$

GPM: average nozzle flow rate in gallons per minute
MPH: travel speed in miles per hour
W: distance between two nozzles in inches136 a constant to convert units to gallons/1000²

**Step 5. Calculate the area covered per tank as follows:**

$$\text{Area Covered per Tank (sq.ft.)} = \frac{\text{Tank Volume (gallons)} \times 1000 \text{sq.ft.}}{\text{Application Rate (gallons per 1000 sq.ft.)}}$$

**Step 6. Calculate amount of material to add to tank.**

$$\text{Amount to Add} = \frac{\text{Area Covered per Tank (sq.ft.)} \times \text{Material Rate per 1000 sq.ft.}}{1000}$$