Backpack Sprayer Modification and Calibration

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Calibration of backpack sprayers to determine sprayer output (in gal/1,000 ft^2) is controlled by three factors: walking speed, nozzle output, and spray width. The following steps will walk you through how to determine each of these factors and calculate your backpack sprayer output.

1. Walking speed (MPH) – Mark off two points 100 ft apart on the surface you will be spraying. Record in seconds how long it to travel the distance. Repeat this step until you achieve a consistent travel speed. It is important to find a walking speed you can maintain throughout the spray; DO NOT walk too FAST! Then calculate walking speed in mph by dividing 68.18 by the time required to travel 100 ft (in sec). *Example 68.18 / 34 sec = 2.0 mph*

2. Nozzle output (GPM) – It is important to use a CF valve on backpack sprayers to maintain constant pressure which will make calibration much easier. The nozzle output in gallons per minute (GPM) can be determined by looking up the manufacturers GPM specifications (i.e. TeeJet Catalog) or can be measured directly with the following procedures:

a) Fill sprayer half full of water.
b) Pump the sprayer to pressurize the tank
c) Pull the handle trigger, start timer for 60 seconds, and collect spray output in a measuring container.
d) Determine volume collected and convert the flow rate to gallons per minute (128 fl oz = 1 gal)

3. Spray width (W; inches) – It is important to hold your spray boom at a constant height to ensure that you maintain a consistent spray width. To determine your spray width, find a comfortable boom height that you can maintain for an extended period (not too high or low). Find an area of dry concrete or gravel and spray a test strip using water (*make sure to maintain constant height). Measure the width (inches) of the spray pattern left on the concrete/gravel

Calculate Sprayer output using the following equation:

$$\boldsymbol{gal/1000\ sq\ ft = \frac{136 * GPM}{MPH * W}}$$

Backpack Sprayer Modification Parts List

Image	TeeJet Part #	Description
	11990-61	Female X hose shank (1/4" N.P.S. x 3/8 hose)
	4727	Sure Grip Handle - brass
	6466	Trigger Valve - brass
	6671-24	Spray gun extension - curved with fixed body, 24"
	-----	Constant Flow Valve (CF Valve) - G.A.T.E., Jacto, or Chapin; **Must be 11/16' thread**; yellow = 15 psi, Red = 21 psi and Blue = 29 psi
	QJT-NYB	Quick TeeJet - 11/16' thread
	CP25607-4-NY	Quick TeeJet caps - full circle, no alignment notch
	CP18999-EPR	Rubber seal gasket - notched; *order extra to replace worn gaskets
	8079-PP-50	TeeJet Strainer - Polypropylene, 50 mesh; *order extra to replace clogged screens
	See catalog	TeeJet spray tips - air induction XR Flat, air induction, extended range flat, twin flat, flood jet, or **Even** flat (spot treatment)
	----	Hose clamps; crimp type preferred
	----	Thread sealant tape

*Material adapted from https://sustainable-farming.rutgers.edu/backpack-sprayer-modification/