

Calibrating Air Blast Sprayers

Shane Curry, Appling County Extension Agent

Calibrating air blast sprayers is something that's often not done, or done improperly. Why is this important? Most pecan growers assume the sprayer is calibrated at 100 gallons per acre (GPA). Consider if it's actually 81.4 GPA (as in the below example). The sprayer is filled to 1,000 gallons and enough chemical is added to the tank for 10 acres. But, at 81.4 GPA you are actually spraying 12.2 acres instead of 10. The 12 oz. rate per acre of Super Tin fungicide was actually applied at 9.8 oz. per acre! Using lower than recommended rates will cause undesirable results. Calibration is critical for all sprayers!

So, how do you calibrate air blast sprayers? In order to calibrate air blast sprayers, we have to know MPH and GPM (Gallons per minute). To calculate MPH, travel a distance of 100 feet at the speed you plan to spray at. Time how long it takes. Multiply the feet traveled by .68 and then divide by the amount of time it takes to travel 100 feet (in seconds).

$$\text{MPH} = \frac{\text{Distance (feet)} \times .68}{\text{Time (seconds)}}$$

Example: 100 feet traveled x .68 and it takes 40 seconds. $100 \times .68 = 68$. $68/40 = 1.7$ MPH

Calculating Gallons per minute

$$\text{GPM Required} = \frac{\text{GPA (the labeled amount required)} \times \text{MPH (determined above)} \times \text{Row spacing (Feet)}}{990}$$

(This number is used if spraying one side like in pecans)

****If one pass is made between rows spraying from both sides of the sprayer (as in blueberries), use 495 as constant.****

Example: The product being used needs to be applied in 75 gallons of water per acre. Pecan trees are 60 feet apart. Using the formula above, $75 \text{ GPA} \times 1.7 \times 60 = 7,650$. $7,650/990 = 7.7$ GPM Required

Next, fill the sprayer. Operate the sprayer at the desired pressure and motor RPM while sitting still. Let the sprayer spray for 5 to 10 minutes. Then calculate the amount of water it takes to refill the sprayer. This is easier if you use a water flow meter since some sprayer gallons aren't clearly marked.

$$\text{GPM (actual)} = \frac{\text{Gallons to refill sprayer tank}}{\text{Minutes of spray time}}$$

Example: Sprayer ran for 5 min. It took 37 gallons to refill sprayer. $37/5 = 7.4$ GPM (actual)

Calculate the Gallon per acre (GPA) being applied spraying from one side on both sides of row (Pecans)

$$\text{GPA (Actual)} = \frac{\text{GPM(actual)} \times 990 \text{ (use 495 if spraying two sides with one pass (blueberries))}}{\text{MPH} \times \text{Row spacing}}$$

Example: $7.4 \times 990 = 7,326$. $1.7 \times 60 = 102$. $7,326/102 = 71.8$ Gallons per acre. This is not enough GPA if product requires 75 GPA. In this example, slowing down from 1.7 MPH to 1.5 MPH will increase the GPA to 81.4 GPA.

****Small changes can be made by changing pressure. Big changes should be made by changing nozzles or ground speed.****