

Proper Air Blast Sprayer Calibration

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As stated on the pesticide label – the sprayer needs to be calibrated before you spray!

Proper calibration of air blast sprayer equipment is the only way to ensure spray applications are effective, efficient and economical. Poor spray coverage is the primary cause of reduced spray product performance. Regular care and maintenance will ensure the sprayer is residue-free and serviceable when needed. A sprayer should never be operated without first checking the calibration for the following reasons:

1. To determine the precise rate of material applied per acre.
2. To ensure each nozzle tip is operating at the manufacturer's specification.
3. To compensate for equipment changes, crop staging and environmental conditions.

Ideally sprayers should be calibrated at the beginning of the season, whenever nozzles are changed, or when changing the nozzle set up based on the crop and desired coverage. The challenge with air blast sprayer calibration is accurate and efficiently collecting and comparing the output from the individual nozzles. As a result, growers most often calibrate by determining how much spray material they had in the tank when starting the application and subtracting how much remained in the tank at the completion of the application and then dividing that amount by the estimated number of acres covered during the application. This method indicates the approximate the gallons per acre for the application. However, it does not give an accurate picture of where the actual material was applied. For example, that method may indicate that fifty gallons per acre was applied but a leak in a hose or somewhere else on the equipment may mean that part of that "application" actually ended up on the ground. If one or more of the nozzles are compromised or worn, then fifty gallons per acre may not be accurately applied to the crops, and uneven application means uneven control of the pest population, which can lead to damage to part of the crop.

Calibration Factors Affecting Application Rate

- Ground Speed
A uniform ground speed is necessary to maintain even spray application. The spray application per acre varies inversely with the ground speed of the sprayer. If the ground speed is doubled the application rate is cut in half and as the ground speed is reduced to half, the spray application is doubled. Rate controllers can only compensate for this within certain limits and can sometimes have a negative impact on spray quality.
- Nozzle Flow Rate
The flow rate through the nozzle varies with the tip size, the pressure applied, and the condition of the tip.

Pre Air Blast Sprayer Calibration Instructions

Prior to calibrating an air blast sprayer, please complete the following tasks:

1. Triple rinse tank and piping. Take special care to flush manifolds and nozzles.
2. Be careful if using pressure wash sprayers. Some say this forces water into sealed parts like bearings. You can use push brooms and hoses to scrub them off. Pay special attention to cleaning both sides of nozzles and around pump and filters.
3. Clean nozzles and record orifice and whirl disc sizes.
4. Flush out line to pressure gauge.
5. Clean filters, including tank filters, suction filters, final filters, and every screen behind nozzles.
6. Make sure all valves, diaphragms, and O-rings are in good condition and working properly.
7. Check tire pressures on both sprayer and tractor.
8. Make sure tachometer is working on tractor.
9. Fill sprayer ½ full with clean water.
10. Please have any operators or mechanics that work with the sprayer/tractor combination on hand for the sprayer calibration.
11. Have sprayer operators manual on hand.

Maintenance of the Sprayer

The following practices will prolong the life of the sprayer:

1. Remove the nozzles and strainers; flush with clean water regularly.
2. Do not use any metal object when cleaning sprayer tips. Use a soft brush or try a can of compressed air (for cleaning keyboards).
3. Never apply corrosive fertilizer solutions through an air blast sprayer.
4. Remove and clean strainers daily or when products change on sequential applications, whichever comes first.

Nozzle wear occurs most rapidly when wettable powders, flowables, or dispersible granules are applied, especially at high nozzle pressures. Under these situations, the tips and cores on the sprayer should be manufactured from hard, wear resistant materials. The abrasion resistant nozzle components cost more initially, but in the long term are quite cost effective.

Calibration Notes

Recording your sprayer calibration calculations for future use is important. By having a record, you can compare your sprayer calibration calculations from calibration to calibration. This information can be useful the next time you check the calibration. This recordkeeping is also due-diligence and is important to have on hand if ever a question arises about product residue, pesticide drift, or any other spray complaint.

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Air-Blast Sprayer Calibration Worksheet

Retain the following information for your records:

Date _____.

Farm _____ Operator _____ Phone _____.

Address _____ Town _____ State _____ Zipcode _____.

Tractor _____ Sprayer _____

Tractor Gear _____ Tank _____ gallons

Tractor RPM _____ Pump Pressure _____ PSI

Measured Distance _____ feet

Time in seconds (down) _____

Time in seconds (back) _____

Average Time in seconds _____

MPH = Miles per Hour

$$\text{Miles per Hour} = \frac{\text{Distance in Feet} \times 60}{\text{Time in Seconds} \times 88} = \left(\frac{\text{Feet}}{\text{Seconds}} \right) \times \frac{60}{88} = \text{_____} = \text{_____ MPH}$$

For Orchards:

Block (# _____) Tree Height _____ ft. Tree Width _____ ft. Row Width _____ ft.

For Vegetable or Other Crops Sprayed:

Crop: _____

Block (# _____) Spray Swath Width _____ ft

$$\text{Linear Feet of Row per Acre} = \frac{43,560}{\text{Row Width}} = \frac{43,560}{\text{()}} = \text{() Feet per Acre}$$

Or Spray Swath Width

$$\text{Speed in Feet per Minute} = \text{MPH} \times 88 = \text{() MPH} \times 88 = \text{() Feet per Minute}$$

Nozzle Output for Air-Blast Sprayer - To determine the left versus right side, look at the sprayer from behind										
Nozzle Output - Left					Nozzle Output - Right					
Nozzle #	Tip Size #	Disc Core #	Fluid Ounces Per Minute	Gallons Per Minute	Nozzle #	Tip Size #	Disc Core #	Fluid Ounces Per Minute	Gallons Per Minute	
L-10					R-10					
L-09					R-09					
L-08					R-08					
L-07					R-07					
L-06					R-06					
L-05					R-05					
L-04					R-04					
L-03					R-03					
L-02					R-02					
L-01					R-01					
Total Left Side Manifold Output in GPM					Total Right Side Manifold Output in GPM					
Total Output for Sprayer in GPM										

GPM = Gallons per Minutes

GPA = Gallons per Acre

MPA = Minutes per Acre or Minutes/Acre

All Nozzles Output = () GPM

Block (#) Minutes/Acre = $\frac{\text{Linear Feet Row per Acre}}{\text{Feet per Minute}}$ = () = () Minutes/Acre

Output - Gallons Per Acre = GPM X MPA = () GPM X () MPA = ()GPA

NOTES: