Calibrating Boom Sprayers

It's based on spraying 1/128 of an acre per nozzle and collecting the spray that would be released during the time it takes to spray the area. Because there are 128 ounces of liquid in 1 gallon, this convenient relationship results in ounces of liquid caught from one nozzle being directly equal to the application rate in gallons per acre, or GPA.

For example: If you catch an average of 15 ounces from a set of nozzles, the actual application rate of the sprayer is equal to 15 GPA. With this method, make sure that the time used to catch output from nozzles is the same as the time it takes to cover 1/128 acre. Table 1 shows the distance you must travel to cover 1/128 acre for different nozzle spacings and row spacings. For broadcast applications, use the nozzle spacing to determine the calibration distance. For band or directed applications, use the row spacing.

To calibrate your sprayer, you need a measuring tape, a watch capable of indicating seconds, and a measuring jar graduated in ounces. A pocket calculator also will be handy.

1. Fill the sprayer tank with water.

2. Run the sprayer, inspect it for leaks, and make sure all vital parts function properly.

3. Measure the distance in inches between the nozzles. Then measure an appropriate distance in the field based on this nozzle spacing, as shown in Table 1.

Table 1. Calibration distance for each nozzle to spray 1/128 acre.

Nozzle/row spacing (in.)	Travel distance (ft.)	Nozzle/row spacing (in.)	Travel distance (ft.)
18	227	30	136
20	204	32	127
22	185	34	120
24	170	36	113
26	157	38	107
28	146	40	102

4. Drive through the measured distance in the field at your normal spraying speed, and record the travel time in seconds. Repeat this procedure and average the two measurements.

5. With the sprayer parked, run the sprayer at the same pressure level and catch the output from each nozzle in a measuring jar for the travel time required in Step 4.

6. Calculate the average nozzle output by adding the individual outputs and then dividing by the number of nozzles tested. If an individual sample collected is more than 10 percent higher or lower than the average nozzle output rate, check for clogs and clean the tip, or replace the nozzle.

7. Repeat steps 5 and 6 until the variation in discharge rate for all nozzles is within 10 percent of the average.

8. Then, the final average output in ounces is equal to the application rate in gallons per acre: Average output (ounces) = Application rate (GPA).

9. Compare the actual application rate with the recommended or intended rate. If the actual rate is more than 5 percent higher or lower than the recommended or intended rate, you must make adjustments.

10. You can start the adjustments by changing the pressure. Lowering the spray pressure will reduce the spray delivered; higher pressure means more spray is delivered. Don't vary from the pressure range recommended for the nozzles that you use. (Look to "Useful Formulas" on the back page to determine the new pressure rate.)

11. You also can correct the application error by changing the actual travel speed. Slower speeds mean more spray is delivered; faster speeds mean less spray is delivered. (Look to "Useful Formulas" on the back page to determine the new pressure rate.)

12. If these changes don't bring the application rate to the desired rate, then you may have to select a new set of nozzles with smaller or larger orifices.

13. Recalibrate the sprayer (repeat steps 5 through 12) after any adjustment.

Calibration for Band Spraying is very similar. To get details go to this online publication or contact my office and I can send you a copy.

Source: Ozkan, H. E., Boom Sprayer Calibration, AEX-520-92, Ohio State University Extension, http//ohioline.osu.edu/aex-fact/0520.html accessed 4/22/08.

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