

Spreader and sprayer calibration

Settings are there for a reason: they guarantee accurate and prescribed product application.

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■ Accurate settings of spreaders and sprayers are based on rates determined through extensive research and testing to be the most effective for the job at hand.

Using less of a control product may make a second application necessary, which is more expensive than doing it right the first time. Using more of the product may cause damaging side effects, which will also be more expensive.

Hand-pressurized and powered sprayers both operate on the same basic principles. Start with clean and well-maintained equipment prior to calibration on both types of sprayers. Calibrate both types using plain water.

Make sure spray tips are clean. Spray water through the tips to visually check the delivery pattern. On individual tips, check for clogging or uneven delivery of material. On sprayer booms, check to be sure that all tips are operating in the same spray pattern.

Hand-pressurized sprayers

1) Fill the "hand can" sprayer tank with a premeasured amount of water, generally from 1/2 to one gallon.

2) Pressurize the unit. And, be consistent. Always pump 15 times.

3) Once the unit is pressurized, start spraying in a premeasured area of known size. (For hand cans, the best size for a premeasured area is 1000 sq. ft.)

4) Spray the entire premeasured area.

5) Pour the remaining water in the sprayer into a clean container, and measure the amount.

6) Subtract the remaining liquid from the initial volume. The difference is the amount of material actually sprayed, based on the walking speed of the person doing the spraying and at the pressure level at which the sprayer was set. This determines the amount of liquid sprayed per the premeasured area of the site.

Change those tips showing a significant variation in the pattern.

Drop spreaders deliver material along the base of the hopper directly to the ground below.

Centrifugal spreaders deliver granular material from the base of the hopper onto a dispensing device that rotates, throwing the material in a curving pattern over a distance to the right, front and left of the spreader hopper.

When calibrating either type, always start with clean, well-functioning equipment.

Have a pre-measured area of known dimensions. Calibrate the equipment with the material that will be applied. Use an amount of material realistic for the size of the spreader, enough to achieve a proper flow.

Large, pull-behind spreaders are calibrated in the same manner as smaller, walk-behind units, but on a bigger scale. Because it's difficult to empty a bigger hopper, the material that's left in the hopper usually can be determined from measurement markings inside the hopper or from the difference in starting and ending weight of the total unit.

Because each person walks at a different rate of speed, each sprayer operator should calibrate walk-behind spreaders or hand-carried sprayers individually to arrive at an accurate calibration. Using a tonal stop-

watch can help set a more consistent walking speed for all personnel.

Once calibrations are set, cross check them throughout the day. Ideally, this would be done at the beginning of each application. Realistically, check once or twice during the day on areas where landscape measurements are known to ensure accuracy.

Accurate application is to everyone's benefit. Proper applications correspond with researchers' best advice. Doing it right the first time will reduce call-backs, and dollars will not be wasted.

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Power sprayers

The area to be pre-measured for calibration of power sprayers should be based on the width of the spray boom. The measuring area should give the equipment a "straight shot" run for at least a 50-75 foot length, a span appropriate to the type of sprayer being calibrated.

1) Set the machine to the proper spray pressure. (Use a measuring container to determine the output of each nozzle at pressure. Write down the output of each spray tip over a specific period of time, such as 10 seconds.)

2) Compare the recorded output figures. Replace any tip that has a variance of plus or minus 10 percent, and repeat step one. Continue changing tips until all are within the acceptable less than 10 percent range.)

3) Check the sprayer to assure proper operation. Then power up the equipment so it is running at proper spraying speed by the time it enters the premeasured area.

4) Drive the unit over the area, turning the sprayer on and off while at operating speeds. Set the speed on the equipment drive, then drive the equipment over the designated area and time the spray interval from the beginning to ending point.

5) Repeat this procedure three times to ensure accurate measurement of time and distance.



Repeat the procedure three times to develop consistent results. Always calibrate and spray under standard conditions, (i.e., wind speed at 10 mph or less).

continued on page 24

6) Now that you have determined the time it takes to cover the premeasured area, measure the volume of output from each spray tip for that same time interval. Add the total output from each of the tips to find the total liquid spray rate. That total is the volume of spray that actually will be delivered over the designated area.

Repeat the procedure to ensure consistency and accuracy.

Now that you know the calibration volume, you can mix according to the calibration rate. To fill a power sprayer with a known output, say 100 gallons per acre, read the product label to find the amount of material that should be applied per 100 gallons or per acre.



Drop spreaders

1) Place the material in the spreader hopper. Start with some calibration number or letter. This will be easier if you have some experience with the material, or if the product label gives a suggested calibration setting. Otherwise, the starting point is a random choice.

With drop spreaders, there are devices that can be attached to the base of the spreader to collect output to measure for calibration determination.

Without such a device, use plastic sheeting or butcher paper to collect the material.

2) Walk a known, premeasured distance over this material, opening and closing the spreader while walking at a normal,

steady pace.

3) Gather the material spread; pour it into a measuring device and weigh it. Be sure to deduct the weight of the measuring device from the total.

Once you know the rate at which the spreader is delivering material, you can compare that rate to what the rate should be. Use the following formula:

rate x area ÷ analysis of material

4) Adjust the calibration number or letter up or down until the proper output rate is achieved. Once that calibration has been reached, repeat the measurement process two or three more times for consistency and accuracy.

Centrifugal spreaders

Several types of centrifugal spreaders have varying kinds of adjustments of distribution. The distribution pattern should be consistent, not skewed to the right or left. The peak of the pattern should be aligned with the center of the spreader.

It may be difficult to determine if a spreader is throwing more heavily to the left or right by sight alone. There are more kits available to measure the patterns of some spreaders. For an accurate check without using a kit, run the spreader across a series of grids that reach across the distribution swath to catch the material delivered. Measure the material caught in each container to determine inconsistency.

Most centrifugal spreaders will have some form of adjustment to correct pattern skew.

1) When checking calibration, use a sufficient amount of material to ensure proper flow. Weigh the amount of material put into the hopper. Make a "best guess" on calibration setting,

starting with product label recommendations if these are

available.

2) To cover the premeasured area, work from the outside pass to the inside pass. Open and close the spreader while moving at a normal, consistent rate. With centrifugal spreaders, the speed of movement is important. The faster the spreader moves, the farther the material is thrown. At a slower rate of movement, less area is covered with each pass and a heavier rate of material is applied. The average swath—and, therefore, the average pass—is six to eight feet.

Position each pass so that the leading edge of the swath of the material applied is thrown back to the wheel prints of the previous pass.

3) Once the area has been covered, pour what's left in the hopper into a measuring device and weigh it (subtract the weight of the container).

4) Subtract the amount of material remaining from the amount initially placed in the spreader. Compare the amount of material actually applied to the label application rate. Use the formula shown for drop spreaders.

5) Reset the application rate up or down to get proper calibration rate for accurate distribution.

6) Once the accurate setting has been reached, repeat the procedure two or three more times to ensure accuracy.

Because material will be applied with each checking process, have multiple premeasured areas on which to apply products.

If a deflector shield is to be used for the outside pass with a centrifugal spreader, *check calibration with the deflector attached*, and make any needed adjustments.

