Calibrating a boom sprayer for broadcast applications
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Sprayer calibration is unique in that the more you explain it, the harder it is. But it doesn't have to be difficult. There are only a few steps:

1. Choose your spray pressure and measure how fast the spray comes out.
2. Choose your total spray volume (gallons per acre).
3. Figure out your speed using a "one-acre strip".

Choose your spray pressure.

-   For flat-fan nozzles, choose the minimum pressure required to produce a nice solid fan. Using a backpack sprayer, this is typically 15 to 20 p.s.i. for three nozzles or fewer, 30 to 45 p.s.i. for up to six nozzles.

    Lower pressures let you minimize the gallons per acre you apply, and they also help to reduce drift.

    BY THE WAY - During calibration, use clean equipment and plain water in the spray tank.
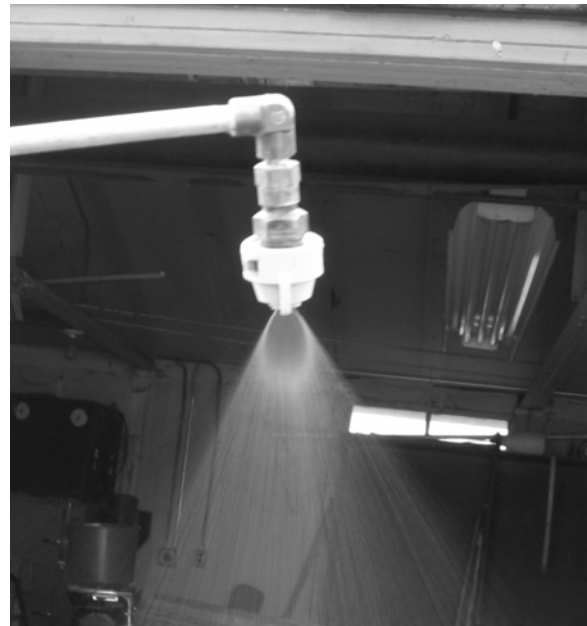
Measure how fast the spray comes out.

-   Spray into cups or buckets, timing yourself. Usually 30 seconds is plenty.

-   Measure how much came out of each nozzle and check for differences. A nozzle that puts out much less than the others might be partly plugged up or have some junk on the screen.

- Figure the total output in gallons per minute.
  - o Add all the nozzles' output together.
  - o Figure the total output for one minute. E.g., if you timed yourself for 30 seconds (1/2 minute), multiply your output by 2.
  - o Now that you have the total output per minute, convert it to gallons. For example, if you measured the output in ounces, divide your output by 128 (128 ounces in a gallon). If your output is in milliliters, divide by 3785. This gives you gallons per minute.

Choose your spray volume (gallons per acre).

- 10 to 15 gallons per acre is a good range for most ground applications. (Some agricultural operations use more, but then they have to refill the tank more often.)

- Calculate how many minutes your sprayer will take to put out those gallons.

Figure out your speed using a "one-acre strip".

- A "one-acre strip" is a long, skinny acre. This is the distance your sprayer has to go to treat one acre. This depends on your *spray width*.

- The *spray width* is wider than the actual boom, because the nozzles at the ends spray wide.

Spray width =
(number of nozzles) X
(nozzle spacing)

Spray width
3 nozzles x
20 inch spacing
= 60 inches (5 ft)
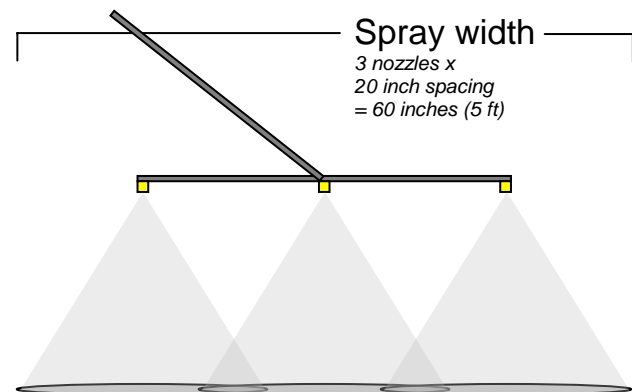
- An acre is 43,560 ft^2. Divide this by the spray width to get the length of the one-acre strip. For this 3-nozzle boom, (43,560 ft^2 ÷ 5 ft) = 8712 ft.

- Finally, figure out your speed.
  Speed = (length of the one-acre strip) ÷ (number of minutes to put out desired gallons per acre)

- Suggestions for maintaining speed in the field:
  - o If on foot, use a metronome or practice your pace over a known distance
  - o If on an ATV, use a low gear and high RPMs

Using a spray gun for broadcast applications

Using a spray gun to cover an area evenly is more difficult than using a boom. However, spray guns are very useful for some situations, e.g., roadsides. Spray gun equipment is usually mounted on ATVs or pickup trucks. For example, the Modoc County agricultural commissioner's office sends out teams of ATV spray gun operators to search for weeds along the back roads.

In his own area, Rob Wilson (farm advisor, Lassen County) found huge variations from one applicator to another in spray treatments. He suggests that every applicator in a team should go through the following calibration. Remember, use clean equipment and plain water for calibration.

To calibrate a spray gun for broadcast treatments,

- Measure out and mark a known area. A good size would be 1/100th of an acre, i.e., 436 square feet – say a strip 10 ft by 44 ft.

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- Walk this strip and spray it to cover, using the same pace and the same arm motions you normally use. Keep track of your time. Note that every applicator is going to have a different style and a different pace, so each one should calibrate his / herself.

- Now spray into a bucket for the same amount of time that it took to cover that strip. Measure how much water came out.

Now you know the amount of spray solution used to cover 1/100 acre. With that information, you can figure out how many acres one tank can cover, therefore how much chemical to put in the tank.

For example, if it takes ½ gallon to spray that strip, then the operator is putting out 50 gallons per acre (1/2 x 100 = 50). A 20-gallon spray tank on an ATV will cover 20/50 (= 0.4) of an acre, and if the operator wants to put out 2 quarts of Roundup per acre the tank should have 0.4 x 2 quarts of Roundup, or about 26 ounces.