Example 2

Banded herbicide application in 12-inch band over corn rows spaced 36 inches apart. Field size is 30 acres and labeled (broadcast) rate is 2 pints per acre. The band is applied with one nozzle per row.

Step 1. Based on a band width of 12 inches, you need to drive 340 feet.

Step 2. You determine that it takes 58 seconds to drive 340 feet.

Step 3. Output per nozzle for 58 seconds is 24 ounces. This means your sprayer is applying 24 gallons per treated acre. Note: When you apply pesticides in a band, you are treating only a fraction of the total area of the field. This area is referred to as treated acres. To determine how many treated acres there are in a specified field acreage, multiply the field acreage by the ratio of the band width to the row width:

Treated acres = field acres X (band width divided by row width).

In this example, 30 acres X (12-inch bands divided by 36-inch rows) = 10 treated acres.

Step 4. To figure out how much herbicide is needed to treat the field:

Multiply the number of treated acres by the gallons per treated acre to determine the amount of total spray solution needed to treat the entire field:

10 treated acres x 24 gallons per treated acre = 240 gallons spray solution.

Example 3

Directed fungicide application using 3 nozzles per row to a crop planted in 40-inch rows. The field size is 30 acres and the labeled (broadcast) rate is 2.5 quarts per acre. The band is applied with one nozzle per row.

Step 1. Based on a row spacing of 40 inches, you need to drive 102 feet.

Step 2. You determine that it takes 17 seconds to drive 102 feet.

Step 3. Output per group of 3 nozzles directed to the row for 17 seconds is 18 ounces. This means your sprayer is applying 18 gallons per acre.

Step 4. To calculate how much fungicide is needed to treat the field:

Multiply field acres by the gallons-per-acre output to determine the amount of total spray solution needed to treat the field:

30 acres x 18 gallons per acre = 540 gallons spray solution.

The amount of fungicide needed to treat the field is:

30 acres x 2.5 quarts per acre = 75 quarts or 18.75 gallons.

Add 18.75 gallons of fungicide to 521.25 gallons of water (540-18.75) to treat the 30-acre field.

Check nozzles for uniform output

1) Find a container marked in ounces. With the sprayer operating at the desired pressure, catch the output from each nozzle for 30 seconds. Write down the output from each nozzle.

2) Add the amounts caught from each nozzle and divide by the number of nozzles to get the average output per nozzle.

3) If the output from any nozzle is more than 10 percent above or below the average, clean or replace that nozzle.

4) If any nozzles required adjustment in step 3, repeat steps 1, 2, and 3 to be sure the output is uniform.

Three types of applications are common with a boom sprayer:

Broadcast—Pesticide applied with overlapping nozzle patterns to ensure uniform coverage for the entire length of the boom.

Band—Pesticide applied in strips or rows in the field.

Directed—Foliar application of a pesticide to cover the entire plant or a specific portion of it.
Follow these easy steps to calibrate a sprayer.

1) Fill your sprayer tank half full with water (no pesticide).
2) From the table (left), determine the distance that the sprayer must travel for each nozzle to spray 1/128th of an acre. Use nozzle spacing (distance between nozzles on your spray boom) to determine driving distance for broadcast sprays. Use band width to determine driving distance for banded sprays. Use row width for foliar sprays directed to the crop.

3) Measure the course distance in the field and flag it for easy visibility.
4) Drive the test course at the desired spraying speed without spraying. The important step here is to record the seconds it takes to drive the measured distance. Be sure to take a “running start” at the starting flag so your tractor/sprayer reaches the desired speed before you begin timing.
5) Park your tractor/sprayer, set your brakes, but keep the engine rpm at the same setting used to drive the test course.
6) Catch spray in a container marked in ounces for the time noted in step 4. Catch spray from one nozzle for broadcast sprayers. Catch spray from all nozzles per row for banded or row crop directed sprays.

7) The amount of water collected in ounces per nozzle (for broadcast) or group of nozzles (multiple nozzles per band or row) equals gallons per acre applied.
8) If necessary, make adjustments to obtain desired output. Change pressure for small adjustments. Change speed (and re-calibrate) or nozzle tips for large adjustments.

When broadcasting, refer to the nozzle supplier’s catalog to determine the appropriate nozzle spacing, position, and height that will result in the spray pattern uniformity that you need.

To spray uniformly, adjust flat fan nozzles so that 30 to 50 percent of the spray pattern overlaps.

To spray uniformly, adjust cone nozzles so that 100 percent of the coverage overlaps (double coverage).

Example 1

Broadcast herbicide application on a 30 acre field at a rate of 2 pints per acre.

Nozzle spacing is 22 inches.

Step 1. Based on a 22-inch nozzle spacing, you need to drive 186 feet.

Step 2. You determine that it takes 32 seconds to drive 186 feet.

Step 3. Output per nozzle for 32 seconds is 13 ounces. This means your sprayer is applying 13 gallons per acre.

Step 4. To figure out how much herbicide is needed to treat the field:

Multiply the number of acres (30) by the gallons-per-acre output (13) to determine the amount of total spray solution needed to treat the field:

\[ 30 \text{ acres} \times 13 \text{ gallons per acre} = 390 \text{ gallons spray solution.} \]

The amount of herbicide needed to treat the field is:

\[ 30 \text{ acres} \times 2 \text{ pints per acre} = 60 \text{ pints or 7.5 gallons.} \]

Add 7.5 gallons of herbicide to 382.5 gallons of water (390-7.5) to treat the 30-acre field.