Boom-less jet – reverse calibration

Step 1. Park the sprayer in an open area where a "wet line" can be seen and measured easily.

Step 2. Put a few gallons of water in the sprayer

Step 3. Turn the boom-less jets on for a few seconds, then measure the width of the spray pattern in feet. (The length of the wet line on the ground).

Step 4. Divide 43,560 (area of an acre) by the measurement in step 3. This gives you the linear distance needed to cover an acre.

Step 5. Select the speed you plan to use while spraying (typically 3-5mph)

Step 6. Calculate how much time (in seconds) is needed to travel the distance found in step 4 at your selected speed. Write that time down, measured in seconds. Now divide it by 10 so you don't have to collect as much water. This will be the amount of time you turn the booms on to collect water. (see example)

Step 7. Cut one of the bottom corners of a plastic trash bag. (about a 6- 12 inch cut) Cover the boom-less nozzles with the top opening of the bag, and hang the bottom of the bag into a 5 gallon bucket.

 Step 8. Turn the boom-less jets on for the amount of time required (see step 6)

 Step 10. Measure the water collected in the bucket, in ounces, then multiply by 10. Now divide that number by 128 to arrive at you gallons per acre.

This is a handy way to calibrate indoors, once you determine the width of the spray pattern. I use this method when I'm checking my calibrations (pump output and nozzle conditions) during the mid-season, or when it's cold outside.

Example:

An ATV "jackrabbit" sprayer:

- When turned on for a few seconds, the sprayer left a 28 ft. wet line on the ground. This is how wide our acre will be. Now we need to find the length..

- Dividing the area of an acre by our known width will give us the length. 43560/28 = 1555.72 ft

- Since no one has a measuring tape that long, we just take 1/10th of our distance. 1555.72/10 = **155.57 ft**. This is the distance we would travel to cover 1/10 of an acre that is 28 ft. wide.

- We selected a 4 mph speed for our ATV spraying. We know that 5,280ft/mile divided by 3600sec./hour will give us **1.47 ft/sec**. **Which is the same as 1 mph**… since we selected a speed of 4 mph: 1.47ft/sec x 4mph = **5.88 ft/sec. Which is the same as 4 mph.**

- We know 1/10 of the length of our acre is 155.57 ft, so if we divide that distance by 5.88 ft/sec we will know how many seconds we need to capture water…for 1/10 of the acre. 155.57ft/5.88ft/sec = **26.46 seconds. Remember, this is only 1/10th of the actual time it would take to cover an acre.**

- We use a trash bag and cover the boom-less jets, then let the bag hang into a 5 gallon bucket. We trim 6 – 12 inches off of one of bottom corners of the bag so the water will flow into the bucket without splashing all over the place.

- After turning the boom-less jets on for 26.46 (26) seconds, we measure the water volume captured in the bucket. **Let's say we end up collecting 160 oz.'s of water for this example.**

- Since we know we only sprayed for $1/10^{th}$ of the actual time needed to cover an acre, we know we only captured $1/10^{th}$ of the water needed. So, we multiply our 160 oz.'s by 10 to find the entire amount of water needed to cover an acre… in oz.'s. Now we just take that number and divide by 128, to convert to gallons. This is the jackrabbit sprayer's calibration, as long as we travel at 4 mph and the pump and jets continue to function properly. Collected 160oz's x 10 = 1600 oz.'s of water, now convert to gallons: 1600oz/acre divided by 128oz/gal = **12.5 gal/acre. This is the calibration of our sprayer.**

If the sprayer is using 2 boom-less jets that are the same size, but are spaced too far apart to cover with a trash bag, just use one jet and multiply the answer by 2. (Measure the wet line using one jet, calculate the distance to travel an acre using one jet, collect the water from only one jet)

If a person wanted to use the "refill method", he/she could still use the equations for finding the distance to be traveled, time to travel, and scale down to $1/10^{th}$. Then the person would just mark the tank after filling on level ground, turn the jets on for the time allotted, and then measure the amount of water needed to refill to the mark on the tank. The volume needed when then be multiplied by 10 and converted to gallons. No need to move the ATV or the tractor, or measure a linear distance in a field. The sprayer remains stationary.

Not needing to move the sprayer makes finding an ideal speed and an easily divisible spray volume for your tank much less time consuming.

In the case of a 14 gallon Cottontail sprayer, maybe our calibration of 12.5 gal/acre would fit the 14 gal tank better if we slowed down by .5 mph. A quick review of the math would tell us that without the hassle of moving the ATV and timing the travel again.