

Herbicide Sprayer Calibration



Shoshone County Noxious Weed Control

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ATV and Boom Sprayer Calibration (continued)

7. Determine the volume of a full spray tank (tank volume = _____gal)
8. From the herbicide label determine the amount of herbicide concentrate to apply per acre.
(Rate = _____oz/acre)
9. To determine how much herbicide to add to tank divide rate by gallons per acre (GPA) and multiply by tank volume.

$$\left(\frac{\text{Rate}(\text{oz} / \text{acre})}{\text{GPA}(\text{gal} / \text{acre})} \right) * \text{TankVolume}(\text{gal})$$

= *HerbicideNeededPerTank(oz)*

When should I recalibrate?

Spray equipment should be calibrated at least at the beginning of each spray season, after changing nozzles, pumps or other fittings. Also recalibration is a good idea if you feel you're using more or less spray solution than you calculated should be used on the area. Checking spray equipment periodically throughout the year is also recommended because just a small amount of wear can cause the equipment to be up to 10% off. This kind of error can really cost you. If you are doing a treatment that costs \$10 per acre, that error amounts to a dollar extra expense per acre. So if you are spraying a large field those over spray costs can add up fast.

1 tsp (teaspoon) =	1/3 Tbsp	5mL
1 Tbsp (tablespoon) =	3 tsp	15mL
1 oz (fluid ounce) =	2 Tbsp	30mL
1 cup =	8 oz	237mL
1 pint =	2 cups	473mL
1 quart =	2 pints	946mL
1 gallon =	4 quarts	3785mL

1 acre =	43560 ft ²
1 mile =	5280 feet
1 hour =	60 minutes
1 minute =	60 seconds



South Dakota University's Calibration of Pesticide Spraying Equipment pamphlet was used as a reference for this pamphlet.

Why Calibrate?

Calibration ensures the correct amount of herbicide is applied. If too little is applied you may not control the target weed. If too much is applied chemical costs increase, you may be in violation of the law and there could be negative effects on humans, livestock and the environment.

Common reasons people don't calibrate:

- It takes too much time...
- It was calibrated when I bought it...
- It's too complicated...
- I have a rate controller so I don't need to calibrate...

But none of these are good enough reasons to not calibrate. It really doesn't take that much time and this pamphlet will help you with the complicated part. Even if your equipment was calibrated at one time or you have a rate controller, you should still be checking the equipment along with routine maintenance of the sprayers. As your equipment wears with regular use parts can stick or just wear out changing the spray rate of the sprayer.

Preparation for Calibration

Always wear the correct personal protective equipment for the last herbicide used in the sprayer, including chemical resistant gloves. Clean all parts of the equipment and be sure all herbicide is rinsed out of the tanks before calibration.

Calibration



Backpack Sprayer (and all other hand wand sprayers):

1. Establish a calibration plot that is exactly 18.5 feet wide by 18.5 feet long. Spray the calibrated plot uniformly with water, noting the number of seconds required.
(Time required = _____ sec)
2. Spray into a bucket for the same number of seconds. Measure the number of ounces of water in the bucket.
(Volume sprayed = _____ oz)
3. The number of ounces collected from the bucket is equal to the number of gallons per acre that sprayer is delivering (Volume sprayed (step 2) = _____ oz = gallons per acre = _____ gal/acre)
4. Determine the volume of a full spray tank (tank volume = _____ gal)
5. From the herbicide label determine the amount of herbicide concentrate to apply per acre.
(Rate = _____ oz/acre)
6. To determine how much herbicide to add to tank divide rate by gallons per acre (GPA) and multiply by tank volume.

$$\left(\frac{\text{Rate}(\text{oz} / \text{acre})}{\text{GPA}(\text{gal} / \text{acre})} \right) * \text{TankVolume}(\text{gal})$$

= HerbicideNeededPerTank(oz)

ATV Sprayer and Boom Sprayers:

1. Fill the spray tank with clean water and adjust the pressure to normal operating pressure.
2. Spray a small patch to determine the spray width, or the width covered in one pass of the spray boom. This is easier to see on a pad of concrete or packed soil.
(Spray width = _____ ft)
3. Collect all the water sprayed from all boom nozzles for one minute. Record this as gallons per minute.
(GPM = _____ gal/min)
4. Determine the average sprayer speed. Drive a measured 200 feet at normal spraying speed and record the time in seconds to complete that trip. (Time = _____ sec)
5. Convert the above measurement to miles per hour (MPH) by multiplying 200 feet times .682 and then dividing by the recorded time.

$$\text{MPH} = \frac{(200 \text{ ft} * .682)}{\text{time}(\text{sec})}$$

(MPH = _____ miles/hour)

6. Determine the gallons per acre (GPA) sprayed by this sprayer by multiplying the gallons per minute (GPM) by 495 then dividing by the speed (MPH) multiplied by the spray width.

$$\text{GPA} = \frac{(\text{GPM} * 495)}{\text{MPH} * \text{SprayWidth}}$$

(GPA = _____ gal/acre)

(Continued on back)