COOPERATIVE EXTENSION SERVICE

CLEMSON UNIVERSITY

Pesticide Information Program Information Sheet

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Educating South Carolinians about Safe and Responsible Pesticide Use

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Calibration of Pesticide Application Equipment Using the 1/128th Method

Uniform Flow + Correct Gallons per Acre + Proper Tank Mix = Accurate Calibration

Uniform Flow

To prepare your sprayer for a specific application at beginning of season or when type of spraying has changed, you must do the following:

1) Determine the best operating speed to suit the field surface, the crop condition, and the operator. Select a speed that is comfortable and that you can maintain for the entire operation.
2) Refer to nozzle manufacturers' catalogs and select the type and size of tips that will deliver the desired rate per acre at the selected speed.
3) Select tips that deliver in the desired rate range, not above 40 lbs pressure for herbicides or less than 60 lbs pressure for insecticides. To reduce drift, apply herbicides with lower pressure and fairly large droplet size. With insecticides and fungicides, small drops are often needed to get penetration and complete coverage of crop foliage.
4) Remove and clean all nozzle tips and screens. Do not use a pocketknife or wire on tips. Use a brush or wooden toothpick, as they will not damage the shape or size of the orifice. Remove and clean suction strainer screens.
5) Pump and flush hoses and boom with clean water from the supply tank.
6) Replace all screens and tips, making sure tips are the correct size and type for the desired spray pattern. Check all connections for leaks.
7) Place a new nozzle in the boom to establish a benchmark for comparisons. Check flow, from each nozzle for 20 seconds to assure that flow is uniform from all nozzles. If any nozzle flow is 10% over the flow of the new nozzle, replace it.
8) Adjust the pressure relief valve until pressure on the gauge is about 15 pounds above the pressure you will be using for spraying. Slowly open the control valve on the agitation lines until the gauge drops to the desired spraying pressure. Now all pump output that is not discharged through the spray nozzles is being recirculated through the jet agitators or the relief valve. The pressure at the jet agitator is determined by the amount of liquid flowing through it. One jet agitator is sufficient for tanks up to 100 gallon capacity; use two in larger tanks.

Check your sprayer performance daily to monitor wear and other physical damage that may occur. Your daily procedure should include Step 7 as a minimum. Daily checks of nozzle flow will indicate when you should recalibrate and/or replace nozzles.

Distance for each Nozzle to Spray 1/128th Acre

(One oz. discharge/nozzle equals one gal. per acre)

Band width or Nozzle spacing (in)	Calibration Distance (ft)
6	681
8	510
10	408
12	340
14	292
16	255
18	227
20	204
22	186
24	170
26	157
28	146
30	136
32	128
34	120
36	113
38	107
40	102

Gallons per Acre

1) Make sure you select nozzles that produce the correct spray pattern, have an adequate droplet size range, and minimize drift. Nozzles should be positioned to obtain a uniform coverage over the target area.
2) Use the table on the front of this leaflet to select the calibration distance. For broadcast application use nozzle spacing. For band application use the band width.
3) Measure off the distance in the field to be sprayed from Step 2. Time the number of seconds the spray rig takes to cover this distance in the gear and at the throttle setting selected for spraying. Make several runs over the distance and average the time it takes. Mark the throttle setting.
4) With the rig standing still, (1) engage the power take-off; (2) set the throttle at spraying position; (3) set the sprayer pressure within the range recommended for the nozzles used.
5) Collect flow from nozzle(s) for the time recorded in Step 3.

   BROADCAST: Collect the flow from one nozzle for broadcast applications. *The amount collected in ounces equals gallons per treated acre directly.*

   BANDING: Collect the spray from all nozzles used to spray the band (i.e., two nozzles per band—collect the total from the two nozzles; three nozzles per band—collect the total from the three nozzles). *The amount collected in ounces equals gallons per treated acre directly.*

Tank Mix

1) To find the treated acres per tank of spray, divide the capacity of your tank by the gallons to be applied per treated acre.
2) To determine how much chemical to add to the tank, multiply the recommended rate per acre by the number of treated acres your tank will cover as determined in Step 1.
3) Field acres is the normal reference to field size.

   BROADCAST: Field acres per tank and treated acres per tank are the same.

   BANDING: Field acres per tank will always be more than treated acres per tank.

$$FAT = \frac{TAT \times ROW}{BAND}$$

Where:

FAT = Field acres per tank

TAT = Treated acres per tank

ROW = Row spacing in inches

BAND = Band width in inches

Remember to add chemical to tank based upon treated acres per tank as in Step 2. Step 3 is used to determine how many crop acres a tank of spray will cover when banding.

Equipment Needed for Calibration

Tape measure or measuring wheel

Flags or stakes for marking distance

Graduated collection container

Stopwatch or watch with a sweep second hand