Various types of hand-held and backpack sprayers are commonly used for spot treating or spraying small turfgrass areas infested with weeds. These types of sprayers are extremely useful for this purpose but like larger types of spray equipment they must be calibrated in order to properly apply the recommended rate of a herbicide. Each year numerous instances of excessive turfgrass injury occur due to improperly calibrated pump-up sprayers.

The overwhelming majority of herbicides used to control weeds in turfgrasses are selective in that they control susceptible weeds without adversely injuring the turfgrass. However, selectivity is dependent upon the amount of herbicide applied per unit land area. The amount of herbicide applied to a unit of land area is more commonly referred to as the recommended rate of the product and is usually expressed in amount of the product to be applied to one acre or 1,000 square feet. For example, the highest recommended rate of Trimec Classic for bermudagrass and tall fescue is 4.0 pts./acre or 1.5 fl. ozs./1,000 square feet. When applied at this rate and according to label directions this herbicide will cause only minimal injury to labeled turfgrasses. But, what would happen if we applied 3 times this amount of Trimec Classic. First, certain turfgrasses would be injured (noticeable yellowing and browning of the foliage) for several weeks after application. Secondly, the client/customer would extremely disappointed due to the high level of turfgrass injury. And, finally, the applicator could be found liable for not following label directions and subject to fines and/or other penalties.

Unless a sprayer is calibrated it is not possible to apply herbicides at recommended rates. It doesn’t matter if it is a large commercial sprayer with a spray boom or a type of hand-held, pump-up sprayer. There are various methods that can be used to calibrate sprayers. One method that is simple, easy to do and easy to remember is referred to as the 1/128th acre method. In this method an area is sprayed that equals 1/128th of an acre. There are 43,560 square feet in one acre. If one multiplies 43,560 square feet by 1/128 the answer is 340.3 square feet. So an area of 340.3 square feet is equal to 1/128th of one acre. Different sizes can be used, but a commonly used dimension to calibrate pump-up sprayers is 18.5 by 18.5 feet. The following steps are used to calibrate pump-up sprayers.

1. Mark off a calibration plot that measures 18.5 ft. by 18.5 ft.
2. Fill the sprayer to normal capacity with water.
3. Pump the sprayer to the pressure normally used for herbicide applications. (Hopefully, your sprayer has a pressure gauge!)
4. Spray water over the plot area while maintaining normal (and constant) operating pressure.
5. Record the time in seconds it takes to spray the plot area: (example: time = 30 sec).
6. At the same constant pressure, by pressure gauge or constant pressure on the handle, spray into a bucket for the same time (number of seconds) it took to spray the plot area.
7. Measure the volume of water in fluid ounces: (example: volume collected = 25 fl. oz.).

The number of fluid ounces collected is equal to number of gallons that would be applied to one acre, if the sprayer is operated at the same pressure and walking speed used in the plot area. In this case the sprayer is applying 25 gallons of water per acre. This quick conversion from fluid ounces per 1/128th acre to gallons per acre (gpa) works since there are 128 fluid ounces in one gallon of water. It doesn’t get much easier than this. Now all there is to do is to determine how much herbicide to add to the pump-up sprayer.

Example:

Using the 128th acre method as described above we have determined the pump-up sprayer is applying 25 fl. ozs. to a 1/128th acre plot area (18.5 by 18.5 ft.), or 25 gpa. The recommended rate for Trimec Classic is 4.0 pts./acre, which is equal to 0.5 gallon of Trimec Classic per acre (remember 8.0 pts. = 1.0 gal.). Now divide 0.5 gallon/acre of Trimec Classic by 25 gpa.

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\frac{0.5 \text{ gallon}}{25 \text{ gpa}} = 0.02 \text{ or } 2.0% 
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Now multiply the operating capacity of the sprayer (let’s use a 2.0 gallon sprayer) by 2.0%.

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2.0 \text{ gallon sprayer} \times 2.0\% = 0.04 \text{ gallon}
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Since it is impractical to measure 0.04 gallon, multiply this amount by 128 fl. ozs./gal. = 5.1 fl. ozs.

So we would add 5.1 fl. ozs. of Trimec Classic to the sprayer and fill to the 2.0 gallon capacity with water.

By using the 1/128th acre method and some basic math we have: a) calibrated the pump-up sprayer, and b) determined the amount to herbicide to add to the spray tank. But remember, you must walk the same speed you used in the calibration plot area, you must maintain the pressure you used in the plot area, and you must hold the spray nozzle tip at the same height you used in the plot area. If you do these things, then you will apply the recommended rate of the herbicide, you will control the target weed, and you will drastically decrease the chance of adversely injuring the turfgrass.