A handy gadget for care of small landscape areas

Knapsack sprayers allow landscape managers of small areas to apply liquid pesticides where dry products were previously used.

by Patrick G. Tvrdy

Knapsack sprayers can be a grounds manager's solution to many pesticide application problems. They are economical and efficient when used for specific tasks.

For example, a 40-degree spray angle tip can be used to deliver a total vegetation control herbicide in a three-inch-wide band along a sidewalk. The 40-degree tip, as opposed to an 80-degree tip, reduces the chances of a significant change in the spray pattern through an inadvertent but small change in nozzle height.

The function of any sprayer is to deliver the correct amount of chemical to a particular target. To operate one efficiently a user must calculate operating pressure, nozzle selection, recommended carrier volume, and chemical rate.

The right pressure

Operating pressure is vital in chemical delivery. Too much pressure and the nozzle creates a pattern composed of many small, fine particles. These particles drift to unintended areas and threaten desirable plants and/or animals.

Too little pressure and the nozzle doesn't penetrate the plant canopy. The pesticide doesn't reach the target pest.

The addition of a pressure regulator to the knapsack sprayer delivers the chemical at a constant rate, increases the accuracy of spraying, and in some cases, reduces constant pumping of the spray unit.

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CALIBRATION OF MULTIPLE NOZZLE SPRAYERS

$$\left[\left(\frac{\text{Time to walk 100 ft.}}{\text{Time to collect 1 pint} \div \text{Number of nozzles}}\right) \times \left(\frac{435.6}{\text{Spray Width in ft.}}\right)\right] \div 8 = \text{Gallons Per Acre}$$

CALIBRATION OF SINGLE NOZZLE SPRAYERS

$$\left[\left(\frac{\text{Time to walk 100 ft.}}{\text{Time to collect 1 pint}}\right) \times \left(\frac{435.6}{\text{Spray Width in ft.}}\right)\right] \div 8 = \text{Gallons Per Acre}$$

CALCULATION OF SPRAY CARRIER VOLUME

$$\left(\frac{\text{Desired area to be sprayed}}{43{,}560 \text{ sq. ft.}} \times \text{Gallons Per Acre}\right) + \text{Sprayer Waste} = \text{Spray volume/area}$$

CALCULATION OF CORRECT CHEMICAL VOLUME

$$\left(\frac{\text{Desired spray tank liquid volume in gallons}}{\text{Gallons Per Acre}}\right) \times \text{Recommended Rate Per Acre} = \text{Amount of chemical in the desired spray tank liquid volume}$$

The four calibration formulas *(above) were developed by Tvrdy in response to inquiries from turfgrass managers on the correct use of knapsack sprayers in pesticide application.*

Nozzle selection

Don't overlook nozzle adaptability of a knapsack spray unit you're considering. Some come with an adjust nozzle permanently attached to the end of the spray wand. These sprayers limit methods of operation. A user's options are decreased.

Beware of units which only accommodate tips designed specifically for those units. Replacement nozzles may be hard to find and the range of patterns and gallons-per-minute delivery rates may not suit your jobs.

The nozzles needed for your job depend upon the types of chemicals, gallonages, spray patterns, and spray widths.

For example, a 40-degree spray an

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gle tip can be used to deliver a total vegetation control herbicide in a three-inch-wide band along a sidewalk. The 40-degree tip, as opposed to an 80-degree tip, reduces the chances of a significant change in the spray pattern through an inadvertent but small change in nozzle height.

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However, in some instances, a 80-degree tip is advantageous. With it an operator can apply a chemical in a 12-inch-wide band along a fence line without having to hold the wand so high that spray blows off target.

Carrier volume

Carrier volume is the amount of liquid needed to move a pesticide from the sprayer to the target. It is determined by operating pressure, nozzle selection, type of carrier, label recommendations, and the operator's walking pace.

Spray carrier volume varies among products. Having nozzles with several different gallons-per-minute delivery rates equip an operator to meet a manufacturer's recommendations for each particular chemical.

For example, if a sprayer is designed to deliver 30 gallons to the acre, and a 15-gallon-per-acre chemical is used, the operator, by simply changing the nozzle, can spray twice the area at the same volume.

Correspondingly, the initial area could be covered with half the volume.

Other tips

Knapsack sprayer users should also consider:

Chemical rate: The chemical rate depends upon the manufacturer's labeled recommendation for their product. And the desired end result.

Proper set-up: Years ago, a user performed complicated math formulations to determine a sprayer's carrier volume and chemical rate.

The cumbersome formulas often led to over-application. This increased cost. **WT&T**