

## Applying Herbicides with a Modified Automatic Drench Syringe

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*Modifications of an automatic drench syringe herbicide applicator to vary spray patterns are described. When used to release established conifers from grass and low shrub competition, this "Spotgun" was faster, less fatiguing, and more versatile than other commonly used systems.*

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Spot application of herbicides to small areas as part of site preparation has proven effective in the northern Rocky Mountains. Four-foot by four-foot tree-centered spots treated with a suitable herbicide have provided control of herbaceous vegetation and have substantially enhanced both the survival and growth of planted conifers. With the most effective (and often most expensive) herbicides, spot application is definitely less costly than aerial broadcast treatment. In addition, spot application may reduce the hazards of post-treatment erosion and the invasion of noxious weeds.

Until recently, equipment for spot application has been limited to backpack wand or boom applicators, spinning disk applicators, or wick-type applicators, each with their unique advantages and disadvantages. Recently, an automatic drench syringe, used by veterinarians and stockmen for administering animal medications, was marketed for herbicide

application<sup>1</sup> (fig. 1). This "Spotgun," and many of the other automatic drench syringes available from veterinary supply companies, ejects fluid material as a

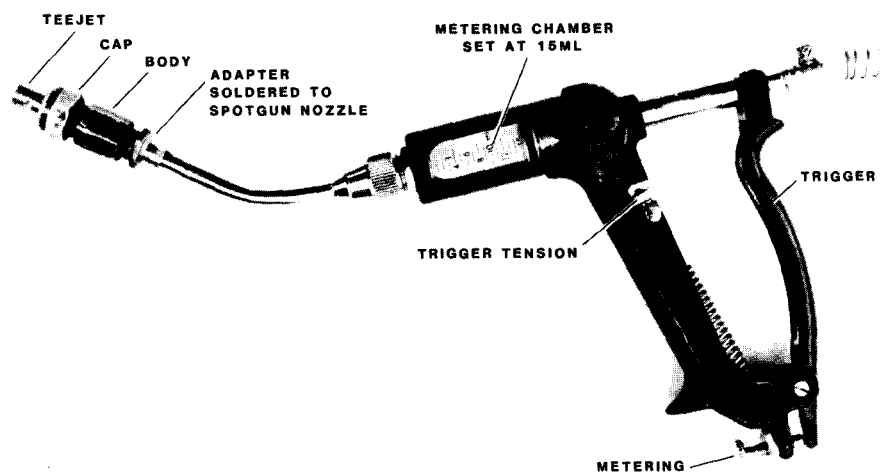
<sup>1</sup>Forestry Suppliers, Jackson, MS.



**Figure 1**—Worker applying herbicide with the modified Spotgun around a tree protected with an improvised shield.

solid stream. It applies a metered amount of liquid with each pull of the trigger and refills the metered chamber (fig. 2) from a small backpack reservoir (figs. 1 and 3).

The type of equipment can easily be modified to deliver a variety of spray patterns. As such, it is a versatile and moderately priced tool for applying herbicides before and after planting. The system has many advantages over other available applicators: it a) allows control of application rate, b) requires no pump or battery power, and c) gives the operator a free hand for shielding trees during post-planting application or for marking treated spots before planting. Also, low maintenance is anticipated.



**Figure 2**—The Spotgun applicator with the nozzle head modification.

### Modifications and Use

A Spraying Systems<sup>2</sup> TKSS 2 Tee Jet Assembly was silver-soldered to the blunt-pointed head of the Spotgun (fig. 2). A variety of Spraying Systems TKSS 2 Tee Jets can be used. A TKSS 2 Tee Jet provides a 4-foot- to 5-foot-wide, fan-type swath pattern (when held 2 to 3 feet above the spray area) that works well. A side-cast spray pattern can be obtained with a suitable Tee Jet  $\frac{1}{4}$ -inch NPT off-center nozzle. With practice, the operator can learn the proper trigger pressure, position above targeted vegetation, and timing to apply a calculated metered amount to the desired area. Practicing with water on dry pavement helps to develop the skills needed.

Extending the delivery tube by about 1 foot would minimize the chances of operators spraying their own feet or lower legs.

For preplanting application, the gun can be held behind the applicator and operated in coordination with the operator's natural pace to achieve the desired spacing of treated spots. On gentle terrain, with few obstacles, a rhythm can be achieved that permits treatment at normal walking speed. Should marking spots with paint be necessary for guiding the tree planter, the operator can use an aerosol can

or a paint gun to mark the center of the spot to be treated (fig. 3).

When herbicides to which the trees are not tolerant are applied postplanting, trees can be shielded as shown in figure 1. A shield can be made from a suitably sized can attached to a 3- to 4-foot handle. The shield should be left over the tree until fine droplets settle.

For spraying in front of or to the side of the operator, the bent delivery tube can be positioned as in figure 2. When it is desirable to spray behind the operator, it is more comfortable to mount the tube so that the bend is in the opposite direction. The bent delivery tube is preferred to the straight tube for these types of application.



**Figure 3**—Worker applying paint spot before applying herbicide with the modified Spotgun.

### Comparison with Other Methods

In a recent effort to release established lodgepole pine from severe grass and small shrub competition, four methods of application were tested. Glyphosate (Roundup) was applied around the trees with (a) the modified Spotgun, (b) a pressurized backpack wand applicator, (c) the spinning disk applicator, and (d) a wick-type applicator. Four workers were employed, each treating 60 to 230 trees with each of the applicators. Trees were shielded from herbicide spray with 3-pound coffee cans mounted on the end of a 4-foot-long piece of aluminum conduit. The time required for each worker to treat a group of trees was recorded and converted to time per tree. In addition, each worker was asked to rate each method of application as to ease of operation, speed, and fatigue potential.

In all respects, the modified Spotgun was rated higher than the other application systems. On the average, workers spent 28 percent less time per tree treating with the Spotgun than with other applicators. Workers rated the Spotgun the easiest to handle, the least fatiguing, and the fastest.

<sup>2</sup> Wheaton, IL (parts available from most agricultural supply outlets).