

A Truck Sprayer for Applying Chemicals to Brush¹

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Abstract. A truck sprayer for applying herbicides to brush is described. It consists of a three-section, hydraulically controlled boom capable of spraying about a 22-ft swath on brush up to 12 ft tall. The spraying system is mounted on a $\frac{3}{4}$ -T truck equipped with additional lights for night spraying. Plots 22 ft wide by 50 to 200 ft long are sprayed.

APPLYING chemicals uniformly is a major problem in brush control research. No totally satisfactory ground equipment has been found. Hand boom sprayers, clustered-nozzle sprayers, and mist blowers are used most commonly for chemical evaluation, but they all have limitations when applying chemicals on brush over 5 ft tall. This note describes equipment useful for applying chemicals on brush up to 12 ft tall. The system consists of a truck-mounted boom sprayer capable of spraying specifically prepared field sites day or night.

Figure 1 shows the sprayer with boom extended. The apparatus consists of a truck, boom, control valves, gasoline engine, hydraulic system, water storage tank, pumping system, and lighting system. A $\frac{3}{4}$ -T truck with

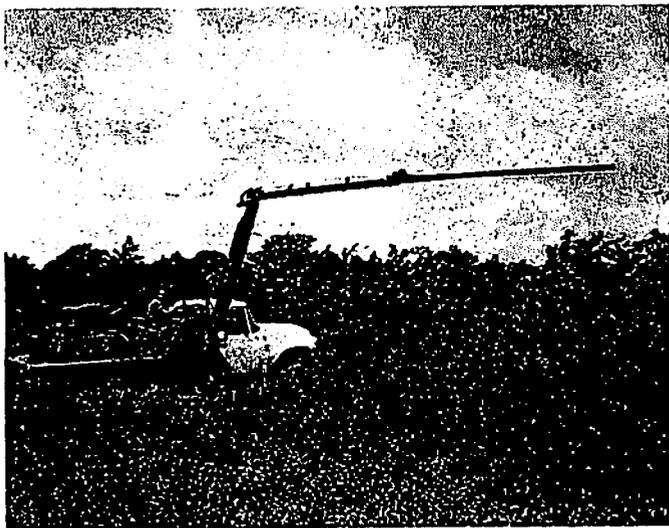


Figure 1. Sprayer with boom extended to spraying position.

four-wheel drive, four-speed transmission, and heavy-duty springs adequately transports the sprayer. It has sufficient maneuverability to permit turning in the al-

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leys. The four-wheel drive is necessary to minimize slippage in soft soil. The four-speed transmission is necessary for steady driving at slow speeds while spraying. A tachometer accurately indicates speed.

The spraying apparatus is a commercially available three-section, hydraulically controlled, 33-ft, Contourmatic³ system. It can be mounted on a standard truck chassis. The first section (118 in long) of the boom is used to elevate the outer sections above the brush. The middle (140 in long) and terminal (130 in long) sections are placed horizontally and permit the spraying of a 22-ft swath.

For traveling between plots, the boom is swung parallel to the long axis of the truck from the spraying position, and the terminal section is folded back over the middle section. This position reduces boom stress and strain, and accidental spraying of plots.

Other equipment on the truck bed is shown in Figure 2. It consists of a 9.2-hp gasoline engine which has a

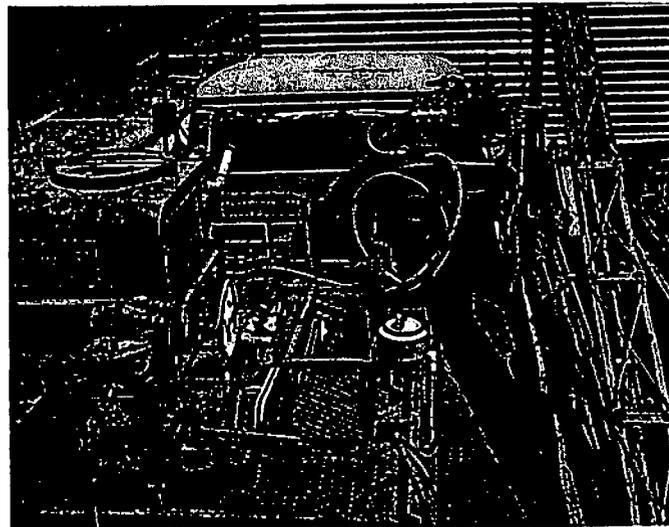


Figure 2. Truck bed showing the spraying apparatus with boom in folded position at right.

four to one speed-reduction clutch assembly that drives the roller pump for the sprayer. A hydraulic pump system operates the boom through a V-belt drive and a countershaft. A clutch mounted on the spray pump allows the operator to disengage the spray pump while

³The apparatus is built by Burg Manufacturing Company, Waverly, Nebraska. Trade names are used solely for the purpose of providing specific information. Mention of a trade name does not constitute endorsement by either the U. S. Department of Agriculture or Texas A&M University.

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the hydraulic system continues to operate. The corrosion-resistant, nylon roller spray pump is rated to deliver 27 gpm at 50 psi and 850 rpm. The spray solution is pumped from a 10-gal container through chemical resistant hoses into the boom; a by-pass allows the excess solution to flow back through a hose into the container. Six containers are carried on the sprayer in a rack mounted in front of the water tank. Water for rinsing the boom between treatments is supplied from a 100-gal metal tank. For rinsing the boom, a three-way 1¼-in valve is positioned to allow water to be pumped from the 100-gal tank through the boom. A valve inserted in the line just beyond the pump is useful to expell air which prevents priming of the pump.

For night spraying, two flood lights illuminate the brush being sprayed and the boom sections. A small lamp mounted on the water tank illuminates the truck bed.

The approximate cost of the sprayer in 1963 was \$9,000. Truck, boom, and materials cost \$8,000, and labor cost for assembly was \$1,000.

Sites to be treated by the sprayer are prepared by dividing the area into blocks 55 to 65 ft wide. Twelve-ft wide driveways, made by either a bulldozer or a road grader, separate the blocks. Plots are staked on both sides of each driveway. The length of the plots is determined by uniformity and density of the brush stand. The length of our plots has varied from 50 ft in dense

stands to 200 ft in open stands. A 22-ft swath is sprayed on each side of a block, leaving 11 ft or more as a buffer zone between plots in the same block.

A driver and boom operator are necessary to operate the sprayer. A third man is beneficial for mixing spray solutions when large numbers of treatments are to be applied. Most spraying is done at night when the wind velocity usually is at a minimum. However, calm periods during the day are used when available. As many as 72 plots have been sprayed in 8 hr.

This sprayer has several advantages over other types of equipment. It is less expensive, and requires fewer personnel and less time and land than does aerial spraying. It also applies a more uniform spray pattern on tall brush than do hand booms, clustered-nozzle sprayers, and mist blowers. The boom is easily folded after spraying, and the sprayer can be transported readily from one site to another at normal driving speeds.

The truck has some limitations. It is hindered by wind, as is true for other kinds of application equipment. Most important, however, it can only be used on vegetation 12 ft tall or less. Thus, either resprouts in cut-over areas or low-growing species are used. Also, the truck can be used only on sites which have had alleys prepared beside the plots. In spite of the limitations, we feel that this sprayer is a highly useful device for brush control research.