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How to Build a - - - -

PORTABLE SPRAYER UNIT

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There has been for several years a recognized need for a portable sprayer with the following characteristics:

1. As little weight as practical.
2. Sufficiently accurate for research work.
3. Unencumbered by power units.
4. Flexible insofar as volume and nozzle pressure are concerned.
5. Simple enough to be readily and rapidly cleaned of residual chemicals.
6. Inexpensive.

The design presented in this publication fulfills those requirements. While adequate for research, it is equally adaptable to the spot spraying of initial infestations of weeds. The use of a reserve compressed-air tank, rechargeable in the farm shop, eliminates the need for a portable power unit.

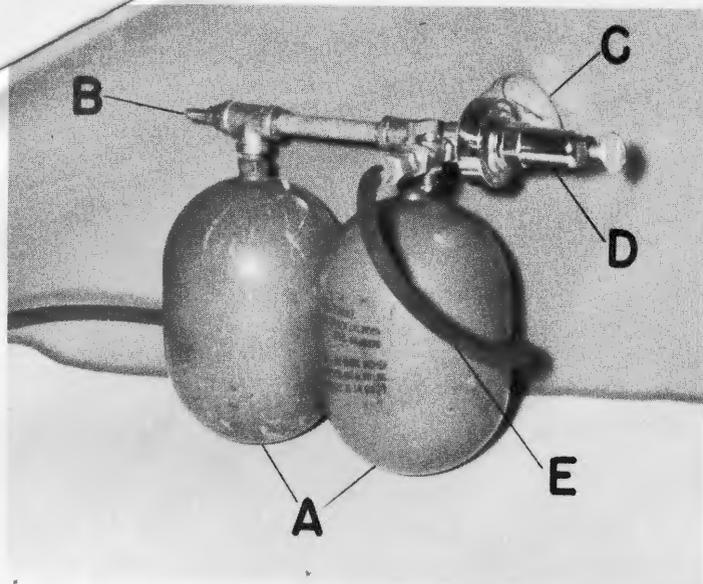
ACCURACY is most important in the construction and operation of this sprayer. Accuracy in measurement of chemicals used and of area treated with a given volume, accuracy as interpreted in cleanliness thereby guaranteeing purity of application, and in the case of wettable powders, accuracy as determined by thorough mixing and a uniform rate of the suspended powder over the treated area.

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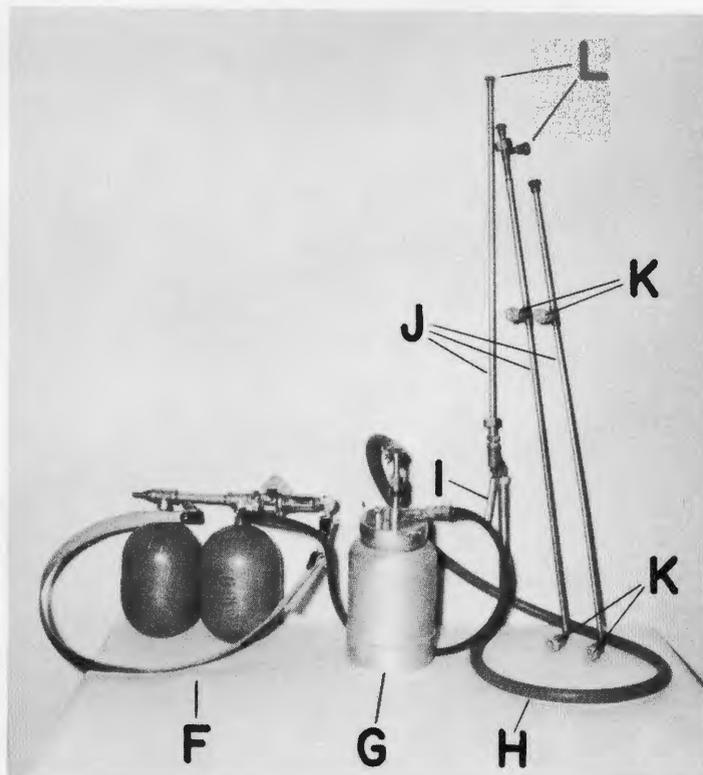
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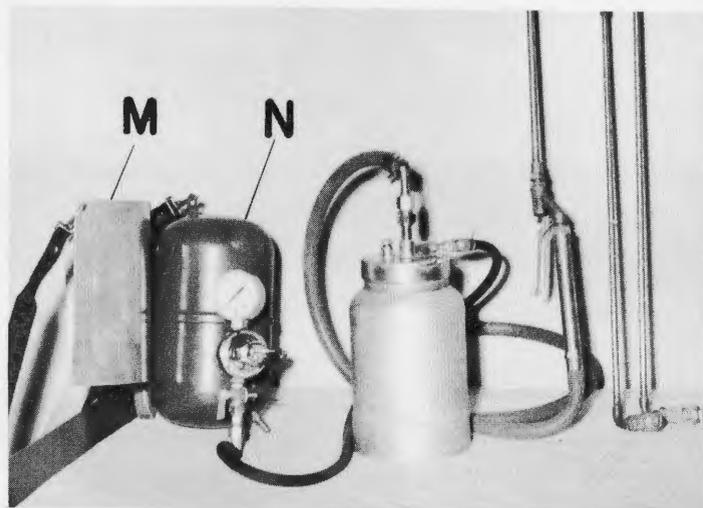
SHOP-MADE COMPRESSED AIR SUPPLY UNIT

- A--Compressed air supply tank using surplus oxygen containers connected together with standard pipe fittings.
- B--Air valve for filling containers with air.
- C--Pressure gauge; 0-100 pounds per square inch (p.s.i.).
- D--Pressure regulator.
- E--Air hose connecting pressure regulator and spray materials container.



COMPLETE PORTABLE SPRAY UNIT

- F--Leather shoulder strap for carrying unit.
- G--Spray materials container (1/2 gallon capacity).
- H--Supply hose connecting spray materials container and hand gun.
- I--Trigger-type hand valve.
- J--Spraying pipes 5/16 inch inside diameter (I.D.).
- K--Spray nozzles (4) Teejet suggested.
- L--Tee connection provides total boom width of 5 feet.



COMMERCIAL-TYPE COMPRESSED AIR SUPPLY UNIT

- M--Metal plate contoured for carrying unit against operator's body.
- N--Commercial-type air container.

## Operation and Maintenance

Tips and Screens - The nozzle tip together with the operating pressure determines the droplet size of the spray. It also helps determine the spray volume and character. Since no single nozzle tip can meet all spray requirements, inexpensive replaceable tips or discs are available to change the size and type of discharge. Nozzle tips vary in rate of discharge, angle of spray, and type of spray pattern. The spray pattern may be hollow cone, solid cone or fan shaped. Fan nozzle tips are considered best for weed control spraying. Hollow cone is best for general insect control.

A removable screen with slightly smaller holes than the nozzle tip opening is built into most nozzles to prevent clogging. The longer strainers are often purchased or adapted to eliminate the frequent cleaning which is objectionable to many owners and operators.

Pressure Gauges - A pressure gauge supplied with the spray unit is properly calibrated within the pressure range of the portable compressed air spray unit. The gauge is installed on the discharge side to guide the operator in properly adjusting the pressure for each spray job.

Pressure Regulator - The pressure regulator is an important part of the unit and is the means of adjusting the pressure as required for any spray job within the pressure range of the portable unit.

Cleaning and Storage - Proper cleaning and storing of the sprayer unit after each use is important. Despite careful efforts to give proper care and the use of resistant materials in construction, some spray chemicals have caused excessive deterioration of spray units. Therefore, study the label on the chemical container before using.

A small metal rod with a piece of cable welded to the end is useful for cleaning boom pipes. Cut a few strands of the cable to form loose ends as this will give a scouring action inside the boom pipes.

A thorough flushing with water is sufficient for continued use with herbicides. Brushes run through the tubular parts will aid flushing action. **Special precautions** are necessary if switches are to be made to insecticides. Special instructions on neutralizers (2,4-D), charcoal, etc., can be obtained. This situation is much simplified by the use of two sets of hoses. **DO NOT** leave equipment set for long periods with solution therein, or following use, without flushing.

Lack of agitation is apparent in this system. As many of the materials used in today's weed control program are "wettable powders" that go into suspension rather than solution, physical mixing will become an added step in the utilization of this sprayer. It is convenient to mix in advance and to carry treatment in containers sufficiently large to permit slushing. A closed container with a volume approximately two times the amount contained makes physical mixing relatively easy.

Power Supply - A reserve air tank can be carried in the trunk of the vehicle. Such a tank might be of the 8- to 10-gallon capacity class and should be tested in excess of 150 p.s.i. pressure. A gauge should be attached to this reserve tank. Pressure from the reserve tank can be bled directly into the small tank (part of the unit) to the point of balance of p.s.i. The regulator built into the unit will determine the pressure at the nozzle tip. Compressed air is available at county shops, service stations and at most ranch headquarters.

Additional Hints - Use pipe thread lubricant especially on connections having similar metal, such as aluminum to aluminum, to prevent seizing which makes it difficult to disconnect fittings like the cap and body of the two-quart spray materials container (paint pot).

A two-gallon stainless steel can could be substituted for the two-quart paint pot for spraying larger areas provided the pressure in the air containers is maintained above 100 pounds per square inch.

Solution Preparation (one of the following):

1. Take all necessary material plus measuring devices; i.e., gram scale, graduated cylinder, pint or quart measure, etc. to the field and prepare treatments at the site of application.
2. Have chemicals, measuring devices and a source of water in a central location. Prepare diagram of applications to be made. Mix chemicals with a measured amount of carrier at this central location. These pre-determined and pre-mixed rates and amounts may be carried to the site of application in convenient sized containers; i.e., quart jars or gallon jugs. Plastic containers are unbreakable but are more difficult to clean of material and outside labeling.

Suggestions for Calibrating the Sprayer

1. Choose appropriate tips and pressure.
2. Measure a plot the size to be treated such as a square rod which would need to be 13' x 21' because of the boom width.
3. Fill paint pot with water.
4. Practice walking at a uniform speed over the plot to be sprayed.
5. Spray measured area with water and determine amount of water used. Repeat several times to be sure you can duplicate the results.
6. Put in amount of chemical and water needed to spray plot or plots.

Contact the county Extension agent for additional information concerning the cost of the sprayer or any of its component parts.