

All about spray gear

The Importance of Reliable Spraying Equipment Calibration and Maintenance

This is a synopsis of an illustrated paper presented recently at Turf '75, a day Seminar held at Reading University and organised by Synchemicals Ltd.

THERE ARE two basic types of spraying equipment, Air Blast—not usually employed in local authority work and Hydraulic used to handle herbicides, insecticides, fungicides, growth retarders, liquid fertilizers, trace elements etc.

Materials for the above applications fall into two types—true solutions i.e. liquid chemicals in water and suspensions i.e. wettable powders in water. True solutions are corrosive to a greater or lesser degree whilst suspensions are certainly abrasive and probably corrosive.

Spraying equipment compatibility and corrosion resistance vary. Among the pump types, diaphragm are corrosion and abrasion resistant, piston are corrosion resistant but susceptible to abrasion, roller vane are liable to corrosion and abrasion whilst centrifugal are also liable to corrosion and abrasion.

Turning to tanks, the hot dip galvanized mild steel type are very good and resistant to corrosion, internally coated tanks are good but susceptible to damage and deterioration. Plastics of various types are mostly compatible but are susceptible to ultra violet light, changes in temperature and certain solvents. Fibre glass are compatible but subject to deterioration and cracking if they are not thick enough and built to a good specification.

Controls and plumbing are either metal-ferrous, coated or galvanized, non ferrous untreated or plastics.

Hoses can be synthetic rubber braided construction or plain or armoured plastic.

Booms can be ferrous or non-ferrous

pipes and jet or plastic pipes and jets.

Types of Spraying Equipment

Tractor mounted—ground crop boom, carrier boom, hand lances etc.

Large trailer unit with ancillary equipment as above.

Land Rover with P.T.O. driven pump or separate engine driven pumping unit and range of ancillary equipment. Suitable also for Haflinger, Unimog etc.

Free standing tanks and pumping units to mount on flat bed lorry or trailer or to fit into a van or pick-up etc. Again a range of ancillary equipment.

Small trailer unit for mini tractors and equipment.

Small power operated, hand propelled unit for hand lance work.

Small pumping units c/w tank, petrol engine or electric drive. Suitable for hand lance work.

Suitable boom length and jet centres are half metre centres for herbicides and 9" centres for growth retarders.

There are basically three types of jets. Fan jets with 80° or 110° angle of spray, hollow cones and flood jets.

When considering the correct height setting of booms and jets overlapping of fan jets should be 4" to 8" depending on patterns and 50% overlapping of cones to avoid stripping.

Calibration

To determine output required, read carefully the instructions given by the manufacturer and then check the Output Chart of the sprayer to ascertain

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the size of jet and pressure required.

N.B. Tractors based on 4 m.p.h. and Land Rovers on 8 m.p.h. Have available a container of water and measuring vessel.

The following procedure should then be followed:—

- (1) Fill tank with clean water.
- (2) Fit correct size jet.
- (3) Run up sprayer and check that the jets are working and anti-drips function.
- (4) Set Pressure Control Valve so that the pressure is as given in the Output Chart for the volume required. (Note any variances for any anti-drips fitted).
- (5) Switch Main Control cock to the "OFF" Position (Note all boom selection cocks are switched "ON").
- (6) Decide gear and engine revs to give 4 m.p.h. P.T.O. speed must be 540 r.p.m. when using wettable powders. If other forward speeds are required consult the Instruction Book under heading "Calculation Formulae", or chart giving jet outputs at different forward speeds.
- (7) With tractor or Land Rover on level ground, top-up tank to the lid rim.
- (8) With two flags mark out $\frac{1}{4}$ acre strip of ground to be sprayed. The distance between the flags will be determined by the width of the boom.

Boom Width

- 18 ft.
- 21 ft.
- 24 ft.
- 27 ft.
- 30 ft.
- 39 ft.

Distance to be covered to spray $\frac{1}{4}$ acre

- 202 yards
- 173 yards

- 151 yards
- 134 yards
- 121 yards
- 93 yards

Distance between flags

- 101 yards
 - 86 $\frac{1}{2}$ yards
 - 75 $\frac{1}{2}$ yards
 - 67 yards
 - 60 $\frac{1}{2}$ yards
 - 46 $\frac{1}{2}$ yards
- (9) Drive at 4 m.p.h. and when the boom is level with the first marker, switch main control to "ON".
 - (10) Drive on down to the second marker and when the boom is level with the second marker switch main control to "OFF".
 - (11) Turn tractor or Land Rover and repeat the spray run in the opposite direction.
 - (12) Return to position where the tank was originally "topped-up".
 - (13) Fill sprayer tank to rim, measuring the exact amount of water added.
 - (14) This will be the amount of water sprayed on $\frac{1}{4}$ acre, and to find output in gallons per acre multiply this figure by 4.
 - (15) If this is the correct output required make note of jet pressure, gear and engine revs for future spraying at this particular output.
If the volume is incorrect, adjustment can be made by either altering the pressure, or by adjustment on the speed of the tractor or Land Rover.

Maintenance

Daily—Sprayer

- (a) flush out with water.
- (b) remove all hoses and run pump dry.
- (c) drain tank.
- (d) wash down externally.

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Filter

- (a) remove and clean filters.
- (b) check gaskets and seals.

Power Drive Shaft (if fitted)

- (a) grease.
- (b) check spring loaded clip.

Pump

- (a) grease if possible.

Pressure Gauge

- (a) check for zero reading and chemical blockage.

Booms

- (a) check jets for alignment damage and wear.
- (c) check hoses for fit and damage.

Storage & Frost Precautions

- (a) flush with water and scrub tank with washing soda.
- (b) flush out with water.
- (c) fill with water and de-watering fluid for metal tanks.
- (d) pump out but not through boom if plastic.
- (e) remove all jets, anti-drip devices, feed hoses and store in a dry, warm, dark place.
- (f) open all valves, remove all end caps and drain plug.
- (g) ensure pump completely empty of water.
- (h) grease and oil all threads, hinges and all surfaces requiring to be kept free from rust.
- (i) store the sprayer in a safe, dry place with the tank lid just open to avoid condensation.

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