

MOBILE OPERATING STATION FOR ULV RESEARCH

J. H. Combellack and J. Bonilla, Department of Conservation and Environment, Keith Turnbull Research Institute, Ballarto Road, Frankston, Vic. 3199

A mobile workstation has been built to evaluate spray patterns of air-assist nozzles on a patternator, and efficacy using a track sprayer.

When used with the track sprayer two twin fluid nozzles are used. The workstation enables accurate reliable application with these at volume rates between 5 and 50 L/ha, at 10 km hr using air volumes up to 150 L/min.

The spray liquid is delivered to the nozzles through one or more of three laboratory pumps. FMI pumps (1) have been selected because accurate, reproducible calibration is possible. The pumps are powered by a 12 volt DC supply and can be operated individually to deliver flow rates from 0 to 260 ml/min. The desired flow rate is obtained by varying the swept area of the piston using a vernier-scale dial. A distribution block with one way valves enables more than one pump to be operated simultaneously to provide higher flow rates. For volumes higher than 750 ml/min a 12 volt diaphragm pump (2) is used. This enables a total flow rate of up to 6.5 L/min to be used. A power supply (3) provides constant voltage to the pumps.

Liquid flow rate is monitored by a flow meter (4) with an accuracy of $\pm 2\%$. Liquid pressure is monitored using a calibrated gauge (5) (Fig. 1). This is necessary to monitor nozzle blockages which can otherwise go undetected because a positive displacement pump is used. Two gauges are plumbed into the liquid line, 0 - 160 and 0 to 400 kPa. The appropriate gauge is selected according to the circumstances e.g., 0 to 400 kPa to accommodate high viscosity liquids.

Air is supplied from the laboratory compressor system. A manually operated three way valve is used to direct the air flow through the "low" (15 to 70 kPa) or "high" (15 to 200 kPa) lines. The air pressure is monitored using calibrated pressure gauges. A 0 to 100 kPa gauge is used for "low" and 0 to 400 kPa for "high" pressures. Pneumatic pressure regulators (6) with different ratings are used to maintain a constant air supply with less than 1.4 kPa change over 700 kPa.

A flowmeter (7) with a maximum capacity of 154 L/min and an accuracy of $\pm 2\%$ monitors air flow to the nozzles. (Fig. 2).

Both air and liquid lines have Legris pneumatic push-in fittings (8), which enables quick and easy connections.

Versatility and accuracy make the work station suitable to accurately monitor tests when using twin fluid nozzles over a wide range of operating parameters. Its movability and compactness enables it to be used in a number of locations, for example patternators and spray chambers. It is eventually planned to use it for field experiments.

- (1) FMI Metering Pump Model RHB.
- (2) Shurflo Diaphragm Pump Model 8000-543-136.
- (3) Good will Model GPS-3060.
- (4) Fisher & Porters Model 10A3567.
- (5) Dobbie Instruments Australia Model 100441.
- (6) Fairchild Model 30.
- (7) Fisher & Porters Model 10A3565.
- (8) LF 3000.