Laboratory performance evaluation of 12 m tractor mounted boom sprayer for cotton crop

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Abstract: Cotton farming is a popular agri-business in India. It is one of the principal commercial crops in India. India is second largest producer of cotton in the world. The major reason for pesticide loss is use of inefficient spraying machines, which are unable to maintain specified nozzle pressure, nozzle discharge, nozzle height that affects spray pattern, droplet size, spray uniformity etc. The proposed sprayer was therefore tested using the instrument spray scanner, pump tester, pressure gauge tester, manometer adapter and droplet analyzer in the laboratory for cotton crop. Different tests were conducted such as liquid distribution under spray boom; pump testing, calibration of pressure gauge and droplet deposition on cotton crop. Liquid distribution under spray boom was scattered from average value, maximum pump discharge was 35.94 L/min at 950 rpm, and pressure gauge gave 520.6 kPa pressures for 600 kPa pressure of master gauge. The VMD, UC and DD for nozzle discharge 0.9 l/min and pressure 689.5 kPa was from 130.9-206.39 µm, 1.18-1.31 and 11-27 No/cm², respectively.

Key words: Boom sprayer, Spray scanner, Pumps tester, Nozzle discharge rate, Nozzle pressure