Development and Testing of Trolley Mounted Solar Operated Low Volume Boom Sprayer

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ABSTRACT

Sprayers are mechanical devices that are specifically designed to spray liquids quickly and easily. A sprayer of this type is a great way to cover large areas such as lawns quickly and easily. The main objective of this paper is to economize the cost of operation by using renewable energy as a source of power and to evaluate the performance of this equipment. Solar operated low volume sprayer was developed with higher operational features.This sprayer typically consists of a tank (20L.) for carrying the liquid to be sprayed, a solar panel (20W), a battery (12V), a control panel, a motor for pumping out liquid, spray nozzle on a boom that automatically disperse the liquid in a downward direction over an appreciable area, ball valve, a chassis with wheels on which the sprayer is mounted, and a hose attachment for spraying. The sprayer runs for complete 90 min after 3 hours continuous charge by exposing in hard sun. The operational features like application rate, swath width, discharge rate and adjustment angle at boom height 43.5 cm was found to be 87.03L/ha, 1.35m, 0.47 L/min and 112.41^{o} respectively on uncultivated land. The field capacity of sprayer was found to be 0.324 ha/h which is very economical for such sprayers.

Key words: Application rate, Adjustment angle, Discharge rate, Field capacity, Swath width.