

## Novel Animal Drawn Wheel-Axle Mechanism Actuated Knapsack Boom Sprayer

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**Abstract :** Manual knapsack sprayer is the most popular means of farm spraying in Nigeria. It has its limitations. Apart from the human fatigue, which leads to unsteady walking steps, their field capacities are small. They barely cover about 0.2hectare per hour. Their small swath implies that a sizeable farm would take several days to cover. Weather changes are erratic and often it is desired to spray a large farm within hours or few days for even effect, uniformity and to avoid adverse weather interference. It is also often required that a large farm be covered within a short period to avoid re-emergence of weeds before crop emergence. Deployment of many knapsack operators to large farms has not been successful. Human error in taking equally spaced swaths usually result in over dosage of overlaps and in unapplied areas due to error at edges overlaps. Large farm spraying require boom equipment with larger swath. Reduced error in swath overlaps and spraying within the shortest possible time are then assured. Tractor boom sprayers would readily overcome these problems and achieve greater coverage, but they are not available in the country. Tractor hire for cultivation is very costly with the attendant lack of spare parts and specialized technicians for maintenance wherefore farmers find it difficult to engage tractors for cultivation and would avoid considering the employment of a tractor boom sprayer. Animal traction in farming is predominant in Nigeria, especially in the Northern part of the country. Development of boom sprayers drawn by work animals surely implies the maximization of animal utilization in farming. The Hydraulic Equipment Development Institute, Kano, in keeping to its mandate of targeted R&D in hydraulic and pneumatic systems, has developed an Animal Drawn Knapsack Boom Sprayer with four nozzles using the axle mechanism of a two wheeled cart to actuate the piston pump of two knapsack sprayers in line with appropriate technology demand of the country. It is hoped that the introduction of this novel contrivance shall enhance crop protection practice and lead to greater crop and food production in Nigeria.

**Keywords :** boom, knapsack, farm, sprayer, wheel axle

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