Development of an Indigenous Motorized Planter for the Sustainable Production of Grain Crops in Nigeria

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Abstract : This technology, whose development revolves round culture, tradition, and prevailing needs of the people, is seen as a solution in promoting development in poor rural communities in many parts of Nigeria. The research was based on one of the food security agenda of the Federal Government of Nigeria by developing a motorized multi-grain crop planter suitable for planting operations in tropical soils. The ergonomic design is tailored towards the ease of planting operations for would-be users, improve crop yields and profitability by minimizing the cost of production. Some properties of the grain crops were determined and were used to develop and assemble the locally-made motorized planter. These properties were used in establishing the design criteria of various components of the planter. The geometric mean diameter of the maize, cowpea, groundnut, and soybean were 8.26 mm, 8.72 mm, 9.51 mm and 6.52 mm respectively, with respective groove depths of 8 mm, 7 mm, 9 mm and 6 mm. The results obtained from the evaluation of the planter confirmed that the planter has a uniform discharge and application rates. The field capacity of the planter was determined to be 0.187 ha/h. Also, the average performance efficiency of the planter was 95.5%, with the average discharge and application rates of 7.86 kg/h and 42.1 kg/ha, respectively. The motorized multi-grain planter can be used in increasing food production, reduce time, cost of production, and can become a major tool to fast-track the food security agenda of the government of Nigeria.

Keywords : design and fabrication, food security, grain crop, motorized planter
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