

Title Development of a Harvester for Amaranthus Vegetable

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Abstract

In Nigeria, leafy vegetables had been mostly cultivated and harvested manually by subsistence farmers. Manual harvesting involve a lot of drudgery, hence with small-scale farmers in mind, a low cost leaf vegetable harvester was designed and evaluated for performance in harvesting Amaranthus sp. The main components of the machine are the frame, the reciprocating blade which cuts the vegetables at a predetermined height above the soil. The machine was powered by a petrol engine rated 3 kW, 1440 rpm and the forward momentum was provided by the pushing action of the operator. The performance of the harvester was evaluated in harvesting Amaranthus specie (Arowojeja) under various crop, soil and operational parameters. The parameters include moisture content of the soil, crop density, working width and the operating speed of the operator.

The result of the tests performed on the machine shows that it is appropriate for adoption by small scale farmers. Furthermore, it shows that the field efficiency of the machine was influenced more by the moisture content of the soil in the furrows rather that the moisture content of the bed, the speed of the operator and the stage of crop development of vegetable prior to the time of harvesting. The optimum field capacity, harvesting efficiency, collection performance efficiency of 0.07hahr^{-1} , 71.5%, 68.3% respectively were obtained at operator speed of 0.27ms^{-1} and crop density of $1,190,311\text{plants ha}^{-1}$.