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RESEARCH PAPER

Modification in existing groundnut digger shaker for invert windrowing

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Abstract : The agricultural mechanization has gained importance for increasing agricultural production, productivity and profitability. Aflatoxin contamination results in downgrading of grains and oilseeds and depletion of their nutritional value. Prolonged consumption of aflatoxins has been reported to cause impaired immune function, malnutrition and stunted growth in children, disabilities and death. The main components of the developed machine were supporting frame, inversion discs, inversion rods, bottom support, side covers, etc. For the performance evaluation of the plant inversion attachment to the existing groundnut digger shaker in terms of total percentage of groundnut pod loss, digging efficiency and field efficiency, three levels of forward speeds *i.e.* 2.0 - 2.5 km/h (S_1), 2.5 - 3.0 km/h (S_2) and 3.0 - 3.5 km/h (S_3) were used. Total percentage of groundnut pod loss was found lower at forward speed S_1 (9.06 %) while higher at S_3 (15.89 %). The total percentage of groundnut pod loss at forward speed S_2 was found 11.86 %. The digging efficiency was measured as 90.94 %, 88.14 % and 84.11 % at forward speeds of S_1, S_2 and S_3, respectively. Similarly, field efficiency was found 83.63 %, 80.10 % and 77.21 % at forward speeds of S_1, S_2 and S_3, respectively. The depth of cut was measured as 130 mm and width of cut was 1016 mm at the moisture content of 18.08 % (d.b.). The draft was measured as 452 kg and power requirement was 18 hp with fuel consumption of 3.93 l/h. The average theoretical field capacity, effective field capacity and field efficiency was calculated as 0.330 ha/h, 0.264 ha/h and 80 %, respectively. The wheel slip was found 7.73 % while inversion index was 72 %.

Key Words : Development, Plant inversion attachment, Existing groundnut digger shaker

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