Development and evaluation of residue cutter for cereal crops

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ABSTRACT

Harvesting of cropthrough combine harvester causes inappropriate disposal of residues of cereal crops which laid on the field. Burning of residue turned into a cause of pollution and wastage of fuel that can be produced from it. Residue recovery from the field may add a profit in farmer's income. On the other hand, burying the residue under the soil at the time of plowing improves soil health. However, the huge amount of residue also creates difficulty in tillage and sowing operations. A small-scale residue cutter was developed to retrieve the residue from the field. It was equipped with two knives which were kept 180° apart and mounted on a hub. Itrotates abouta vertical axis at a high-speed and was powered by a vertical head gasoline engine of 1 kW. The diameter of rotor was 230 mm and was tested on a paddy straw at 2586 rpm (31.15 m/s) and 0.86 km/h forward speed. Excellently, its cutting efficiency was reported more than 99% at power and fuel consumption of 0.40 kW and 0.23 l/h, respectively. It consumes 45 man-hours to cut the residues of one-hectare land.

Keywords: Residue cutting,Cutting efficiency, Power consumption, Fuel consumption.

Introduction

Leftovers of crop residue on the field after harvesting create adverse environmental effects. In India, cereal crops like rice, wheat, and barley are majorly grown. Rice production significantly contributes tothe economy of India. More than 20 states across the nation

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