

SELF-DRIVEN STUBBLE CLEANING AND LAND PREPARATION COMBINED MACHINE, CHINA

自驱动灭茬联合整地机的设计与试验研究

Ph.D. Hu Jun ¹⁾, Ph.D. LI Hailiang ¹⁾, B.S. Song Yujie ¹⁾, B.S. Zhang Haibo ^{1,2)}, B.S. Zhang Zhongxuan ^{1,2)},
Ph.D. Khokan Kumer Sarker ³⁾

¹⁾College of Engineering, Heilongjiang BA YI Agricultural University, Daqing/China; ²⁾Heilongjiang province Beian Authority, Jianshe farm / China; ³⁾Bangladesh Agricultural Research Institute, Dhaka/ Bangladesh

Tel: +86-130-69645265; E-mail: gxcylhl@163.com

Keywords: stubble-breaking cultivating machine; self-driven; design; test

ABSTRACT

In order to solve the problem consisting in the large amount of energy consuming of stubble-breaking cultivating machines, according to the current cultivation mode in the northeast China and the conservation tillage agriculture technical requirements, a self-driven stubble-breaking combined cultivating machine that can work with big-power tractors has been designed. Also, there were designed the transmission system, cutting stubbles device and self-driven wheel on the basis of calculating the size and analyzing the track of the moving parts; the speed range of stubble cutter shaft is 904~1365rad/min. Experiment results showed that the machine's cutting stubbles rate is 92.30%, mashing clods rate is 95.03%, saved fuel consumption is about 25.3~33.8%, function and technology meet the requirements of corn no-till seeding of ridge culture area in northeast China. The results of the study have a great significance in reducing the agricultural equipment energy consumption, providing reference for the study of the corresponding high efficiency and energy saving of equipment.

摘要

灭茬整地是耕作过程中的重要环节，其在工作过程中需要消耗大量的功耗，是影响农业生产成本的主要因素。为了减少整地的功耗，降低生产成本，提高农民收入，本文设计了一款可与大马力拖拉机配套使用的自驱动灭茬联合整地机。首先，根据东北地区的耕作模式和保护性耕作的技术特点，提出自驱联合整地机的设计要求。其次，通过理论分析与计算对传动系统、灭茬装置和自驱装置等主要结构进行了设计。最后，制作样机并进行田间试验，试验结果表明：自驱动灭茬联合整地机的灭茬率为92.30%，碎土率为95.03%，节省油耗约为25.3~33.8%，工作效果显著，技术性能可靠，满足东北垄作区玉米免耕播种的要求。研究结果对降低农业机具的工作能耗具有重要的意义，为研究相应的高效节能机具提供了参考。