

玉米茬地免耕播种机具导向系统设计与试验 Design and Experiment on Oriented System for No-tillage Planters in Maize Stubble Field

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关键词: 免耕播种机 玉米茬地 导向 设计 试验

摘要: 设计了一种由机具导向架、液压系统和以DSP为核心的控制单元组成的机具导向系统。根据与该系统配套的拖拉机确定了机具导向架的基本参数, 并对机具导向架外框不同位置的受力分析得出该系统可以推动的最大负载满足机具田间作业的要求。以JDT654L型拖拉机为试验平台, 进行了系统性能试验。结果表明, 机具导向架的调节范围为 $-10.8^{\circ} \sim 10.7^{\circ}$ ; 该系统换向平稳, 换向时间短, 对输入信号有较好的响应和控制精度, 跟踪信号的最大误差角度不超过 $1.5^{\circ}$ , 能够实时地调整机具前进方向。An oriented system for no-tillage planters, which consists of guiding frame, hydraulic system and control unit was designed according to the problem of no-tillage planting quality resulted from the unefficient maize row-following capacity of no-tillage planter in annual double cropping areas. The main parameters of guiding frame determine on the matched tractor. Furthermore, the force analyses in different positions of the outside frame of guiding frame indicates that the guiding system can meet the requirements of the maximum load for adjusting planter direction in the planting. By employing JDT654L tractor as a test platform, the system performance analysis was conducted, and the results showed that the adjusting range of actuator is  $-10.8^{\circ} \sim 10.7^{\circ}$ . Moreover, the outcomes also indicated that the system is capable of commutating steadily and rapidly, and performs a fair response capability and satisfactory control accuracy to input signals, with maximum error angle of no more than  $1.5^{\circ}$ , which assures that the implements direction could be timely corrected.

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