

八爪式株间机械除草装置虚拟设计与运动仿真 Virtual Design and Kinetic Simulation for Eight Claw Intra-row Mechanical Weeding Device

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摘要: 设计了一种适合作物株间作业的八爪式机械除草装置,采用Pro/E进行了虚拟样机设计,建立了除草装置的装配模型,利用ADAMS软件对该装置进行运动学仿真,得出在不同速比下的除草铲齿运动轨迹,通过计算得到除草铲齿与土壤接触部分的面积,并对每个铲齿的覆盖区域以及相邻铲齿覆盖的重合区域进行分析,确定的合理速比为 $\lambda=0.754$ ,优化了装置的结构和运动参数。An intra-row mechanical weeding device was designed. The device is one part of intelligent weeding machine. It has eight hoes that could turn in or turn out of intra-row area in the intelligent control system to eliminate the intra-row weeds. A 3-D parametric model of intra-row mechanical weeding device was built up with Pro/E, and was input ADAMS. The device was simulated on kinematics by ADAMS to get the track of each hoe. By analyzing the tracks, the area for each hoe with the superposition of adjacent hoe were figure out. Based on analysis result, the optimal proportion of rotation speed and forward speed was obtained ( $\lambda=0.754$ ). Simulation proved that the device could satisfy the need of intra-row weeding.

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