果树冠层参数实时检测系统 Real-time Measuring System for Fruiter Canopy Parameters

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关键词： 果树 冠层参数 超声波传感器 CAN总线 仿形喷雾

摘 要： 为了降低农药喷施环境污染和提高水果品质，实现果园果树仿形精确喷雾，建立了一套果树冠层参数的实时检测系统。该系统主要由作物识别系统、车辆姿态系统、主控单元和数据记录单元组成，采用CAN总线进行数据通信。对5棵临近的绿篱树进行了初步的靶标距离检测试验，试验重复3次。采用4个超声波传感器分时检测，拖拉机前进速度为0.3 m/s，系统采样速率为5次/s。试验表明，系统能可靠地按一定的采样速率，实时检测和记录系统载体车辆位置、姿态（地面平整度）和果树靶标的距离等数据，为精确仿形喷雾提供了一个较好的喷雾控制平台。 To achieve precision application of pesticides and fertilizers to fruiter, a real-time measuring system for fruiter canopy parameters is developed to guide precision spraying in orchard. It can reduce the negative impacts on the environment as well as improve fruit safety. The system consists of crop identification system, vehicle attitude system, master control unit and data logger unit，and a CAN bus is used to connect the microprocessors involved. Primary experiments are conducted on five adjacent trees with regular cylinder-shaped canopy on the campus for three times. Four independent ultrasonic sensors are used to measures the canopy of the target trees on a time-division basis. System sampling rate is 5 times/s; and the tractor-traveling speed of 0.3 m/s is selected. Experiments show that the system can detect fruiter canopy size in real-time, and provide a good measuring and controlling platform for precision spraying based on tree canopy.

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