采用倾角传感器的水田激光平地机设计

Design of a laser land leveler for paddy field

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作者	单位
李庆	男,博士生。广州华南农业大学工程学院，510642
罗锡文	男，教授，研究方向：农业机械化工程。广州华南农业大学工程学院，510642。Email:xwluo@scau.edu.cn
汪懋华	中国农业大学信息与电气工程学院，北京 100083
赵祚喜	华南农业大学工学院，广州 510642
许耀军	华南农业大学工学院，广州 510642
区颖刚	华南农业大学工学院，广州 510642
刘刚	中国农业大学信息与电气工程学院，北京 100083
林建涵	中国农业大学信息与电气工程学院，北京 100083
司永胜	中国农业大学信息与电气工程学院，北京 100083

中文摘要：

研制的采用倾角传感器的激光平地系统用于南方水田土壤的平整。平地机具通过三点式悬挂机构与拖拉机相连接，用左右两个油缸实现升降，由普通三位四通电磁换向阀控制油缸，分别采用激光与倾斜传感器实现平地机具左右侧升降控制。试验结果表明，采用倾角传感器的水田激光平地机在水田的平整精度能基本满足农艺要求。

英文摘要：

Laser leveling technology offers many benefits in terms of increasing water utilization efficiency and crop yields. A laser leveler was developed for paddy field using a specially designed harrow connected to a tractor by means of a hydraulically driven 3-point linkage mechanism and a leveling control system where a tilt sensor was installed in addition to an ordinary laser system. The movement of one of the two cylinders of the linkage mechanism was controlled by the laser system, and the other cylinder was governed by a control circuit according to the signal from the tilt sensor fitted onto the harrow to indicate the degree to which the whole harrow was out of balance horizontally. The latter cylinder controlled the corresponding end of the harrow to track the other laser controlled end and keep horizontal balance of the harrow. The structural design and operation principles both mechanically and electronically were introduced in the paper, and the test results were also included. Field tests showed that the independent control of the two cylinders was necessary and it was more economical and more convenient in paddy field.

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