

变量穴施水穴播机设计

杨术明 杨青 杨成海 邢振 安云飞

西北农林科技大学

关键词: 穴播机 变量施水 控制系统 设计

摘要: 设计了一种可根据田间的土壤含水率自动改变施水量的精密穴施水穴播机。系统集成应用微控制器、GIS、GPS以及VRA技术,采用快速型单片机W78E58作为控制中心,大容量U盘作为GIS数据传递的媒体,以基于OEM模块自主开发的GPS接收机作为定位装置。系统通过集中器内的光电传感器对种子的下落进行监测,然后控制施水播种机构,实现水、种同穴施播。研制的控制系统应用于玉米穴播机,静态校准试验结果显示,控制系统具有良好的线性特征,光电传感器对玉米种子的检出率为99.5%。 A variable rate precision irrigating hill-seeder was designed, which could change the amount of irrigating water automatically according to the soil moisture content of the field. A control system integrating single-chip computer, global positioning system (GPS), geographic information system (GIS) and variable rate application (VRA) technologies was developed. The system employed a high speed single-chip W78E58 unit as the control center, a high capacity U-disk for GIS data transfer, and a self-developed GPS receiver as the locating device. The system could detect a falling seed through a photoelectric sensor installed insider the collector of the seeder, and then opened an electromagnetic valve to control water delivery so that the seed and water could fall at the same time and place. The amount of water was determined by the minimum soil moisture content required for seed germination. The control system was adapted to a maize hill seeder. A static calibration experiment showed that the controller had good linearity. The detection rate of the photoelectric sensor for the maize seeds reached 99.5%, which indicated that the control system had high control accuracy.

[查看全文](#) [返回首页](#)

[引用本文](#)