

农田土壤含水率和坚实度采集仪设计与试验 Design and Test on the Field Soil Moisture and Compaction Acquisition Instrument

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摘要: 设计了可以定位、快速、同步测量农田土壤含水率和坚实度的采集仪。在探讨该仪器测量原理和软硬件设计的基础上,对其测量的准确性进行了试验分析。某苗圃地,选定5 m×5 m的30个采样点,用农田信息采集仪和烘干法分别测量各点的土壤含水率,并对测量值进行简单相关分析,其相关系数为0.917 9,达到极显著性相关。以同样的方式,采用农田信息采集仪和SC900型数字土壤坚实度仪,分别测量30个采样点10 cm和20 cm深度处的土壤坚实度值,并对两种方法在两个深度时的测量值进行相关性分析,其相关系数分别为0.8267和0.9245,达到极显著性相关。试验结果表明,该采集仪对农田土壤含水率和坚实度测量的准确性可满足农业生产要求。 A field information acquisition instrument for positioning, rapid and simultaneous measurement of soil moisture content and compaction was designed. Based on the measurement theory and the software and hardware design of the instrument, the accuracy of measurement was analyzed. 30 soil samples were taken from a tree nursery with the sampling interval of 5 m×5 m. The soil moisture content was measured by the field information acquisition instrument and drying method, respectively. The correlation analysis of the measurement values was carried out and the correlation coefficient is 0.917 9. In the same way, 30 samplings of soil compaction in deeps of 10 cm and 20 cm were measured by the field information acquisition instrument and SC900 digital soil compactness instrument. The correlation analysis to the measurement values of tow depths by both methods was carried out and the correlation coefficients were 0.8267 and 0.9245, respectively. The test results showed that the measurement accuracy of acquisition instrument for the soil moisture content and compaction in field satisfied the requirement of agriculture production.

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