

环形土槽微耕机试验平台设计 Design of Micro-cultivator Testing Platform with Annular Soil Bin

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摘要: 针对传统的微耕机田间试验受多种因素影响, 而室内直线土槽无法进行可靠性试验, 设计了可连续作业的环形土槽微耕机试验平台。采用封闭式环形土槽及轨道, 实现试验平台长时间循环作业。各功能台车分开布置, 台车上、下部的六轮行走机构及可转动的侧轮支轴, 实现了台车在轨道上平稳运行及顺畅转弯。微耕机试验平台融合了上、下位机的自动控制技术、多传感器技术、无线通讯技术、园林灌溉技术等, 实现了田间工况的重复模拟, 既可进行性能试验又可进行可靠性试验, 并能够对土壤坚实度、土壤含水率、微耕机扶手振动及受力等10余项数据进行实时采集和处理。 Traditional micro-cultivator field tests were restricted by many factors, and reliable tests in liner soil bins indoors could not be conducted; however, a new type of micro-cultivator testing platform was developed which could be performed continuously. The lengthy cyclic operations of the test platform were realized by adopting annular soil bins and closed-ended tracks. Functional trolleys were arranged individually so that they could walk steadily and swivel on six-wheeled walking mechanisms in the upper and lower trolleys, as well as the rotatable side wheel shaft. The platform merged upper and lower computer automatic controls, multi-sensors technology, wireless communication, gardens irrigation technology etc. Field conditions were simulated repeatedly. Performance and reliability experiments could both be carried out. More than ten parameters such as soil firmness, soil moisture, oscillation and forces of micro-cultivator handling etc. were collected, displayed and analyzed conveniently by the micro-cultivator testing platform.

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