

水田风送低量喷杆喷雾机设计及其参数研究

Design and parameter test of the low volume air assistant rice boom sprayer

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中文摘要:

为适应水稻病虫害防治的需要, 研制了一种轻便、高效、省药、能减少对环境污染、与目前中国水稻插秧机通用底盘配套、可实现水稻低量风送精确喷雾的水田风送低量喷杆喷雾机。采用机电一体化技术, 气流辅助技术, 低量喷雾技术为中国设计生产出第一代用于水稻病虫害防治的喷杆喷雾机, 提高了插秧机通用底盘的利用率; 作业效率 $2 \text{ hm}^2/\text{h}$ (作业速度 $0.82\sim 0.98 \text{ m/s}$), 可进行 $150\sim 180 \text{ L}/\text{hm}^2$ 的低容量喷雾作业; 风送系统风速达 14 m/s ; 将喷雾不均匀度由常规喷雾的50%降低到10%, 农药利用率达35%; 并能对喷雾轨迹进行标识, 同时还解决了喷杆的自动折叠问题。

英文摘要:

A new rice translator general chassis mounted low volume air assisted rice boom sprayer was designed to meet the demand of chemical pest control in rice field. This sprayer characterized light weight, high efficiency, saving pesticide and being friendly to environment. The techniques of low volume spraying and air-assisted boom spraying were applied at the same time in this system. The small droplets toward to the target by assisting of air stream can increase the penetrability. Experimental results show that the new sprayer can save more than 15% pesticides, working speed in rice field is $0.82\sim 0.98 \text{ m/s}$, and working efficiency is $2 \text{ hm}^2/\text{h}$, wind speed of air assistant outlet is more than 14 m/s , improving the utilization rate (above 35%) and control efficiency and decreasing significantly environmental pollution caused by the application. At the same time the key technological problems between low volume and boom air-assisted spraying for this rice sprayer have been solved.

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