

便携式叶绿素、氮素、水分一体化测定仪设计 Development of a Portable Meter for Detecting Chlorophyll, Nitrogen and Water Contents of Plants

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关键词: 作物叶片 检测 养分 水分 便携式仪器

摘要: 建立了可以同时检测作物叶片叶绿素、氮素和水分的数学模型。结合光谱学原理, 设计了由近红外LED光源、窄带干涉滤光片、光电检测芯片以及单片机系统组成的作物叶片叶绿素、氮素、水分检测一体化便携式仪器, 避免现有仪器由于叶片位置和测定时间差异导致的作物养分探测误差, 可用于作物养分和水分的精细管理。A new mathematical model for detecting the contents of chlorophyll, nitrogen and water of plants at the same time was established. Combined with the theory of spectroscopy, a portable meter for detecting the contents of chlorophyll, nitrogen and water in crop leaves was developed, which could avoid the error caused by different measuring time and different measuring location on the leaves when the three measuring parameters were accomplished by different instruments. The measurement result could give a better suggestion to precision fertilization and irrigation. The developed meter was composed of NIR (near infrared) LED (light emitting diode), interference filter, photodetector and microprocessor system.

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