

基于传感器的变量施肥机定位方法 Positioning Method of Variable Rate Fertilizer Applicator Based on Sensors

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摘要: 简述了一种应用传感器代替GPS的变量施肥机定位方法。控制器读取传感器的脉冲信号, 计算施肥机的行走距离, 由自动网格识别算法实现施肥机自动网格识别。本文给出了传感器测距累积误差校正方法以提高定位精度。对于垄长为40 m的网格, 要使定位误差小于6%, 累积误差应小于2.4 m。实验结果表明, 经过校正, 拖拉机行走距离为250 m的时候, 光电编码器和接近开关传感器测距累积误差分别为2.32 m和2.34 m(定位误差小于6%)。如果在此定位误差条件下, 增加操作单元垄长方向划分的距离, 可满足更长地块作业的定位要求。 A positioning method of a variable rate fertilizer applicator with sensors is introduced, to replace GPS in precision agriculture. In the positioning system, the controller receives pulse signals from the sensor and calculates the working distance of the variable rate fertilizer applicator, thus the grid in which the fertilizer applicator is working is identified by the algorithm of automatic grid recognition. The accumulative error of the system from the sensor is corrected by the error revising algorithm, and the correction results were tested in field. The experiment results showed that the accumulative errors for the photoelectric encoder and the proximity transducer are 2.32 m and 2.34 m, within 250m of working distance, respectively, i.e. the positioning errors is less than 6%. Under the above conditions, a variable rate fertilizer applicator can be applied in a larger working field if the working grid is divided longer.

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