

# INTELLIGENT PREVENTION AND CONTROL TECHNOLOGY FOR BANANA PESTS AND DISEASES

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To solve the problems of low intelligence of chemical prevention and control of pests and diseases, as well as the serious loss of pesticides of banana orchards. The paper was explored the technology of target detection in the canopy of banana plants and developed an intelligent real-time target spraying control system, which aim to improve pesticide utilization and achieve precise spraying. Based on the three-dimensional point cloud characteristics of the banana canopy obtained by millimeter-wave radar, the adaptive DBSCAN clustering algorithm and the adaptive Alpha\_Shape algorithm are used to cluster and extract the canopy information, and finally obtain the three-dimensional model information of the banana canopy. In addition, research was conducted on the wettability of banana leaves and the interaction mechanism between pesticide droplets, and an equivalent model of the banana canopy was constructed. Based on the three-dimensional model of the banana canopy, a real-time target spraying control system was developed, including software design for human-machine interaction interface, upper and lower machine communication module, main control program, variable wind delivery module, and variable spraying module, achieving real-time target spraying control for banana orchard spraying operations. Comparative research on continuous spraying mode and automatic target spraying mode showed that, under the premise of meeting the requirements of chemical control, the automatic target spraying mode significantly reduced the amount of pesticide used, achieving the goal of increasing efficiency and reducing pesticide application, and realizing intelligent pest and disease control in banana orchards.

**Keywords:** Target recognition, Canopy reconstruction, target spraying, variable spraying