AGRAS T30 DRONE SPRAYING EFFICIENCY AND COST ANALYSIS ON SUNFLOWER FUNGICIDE APPLICATION

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Abstract

This study presents a comparative analysis of the application of Orius fungicide on a 200-hectare sunflower field using the DJI Agras T30 drone for 100 ha and the John Deere 4630 sprayer for 100 ha. The research evaluates both methods in terms of resource consumption, operational costs, application efficiency, and environmental impact. The analysis focuses on application efficiency, dosage, and economic aspects to identify the advantages and limitations of each method. The results indicate that drone application achieves superior precision with reduced chemical and water usage, while the tractor-based sprayer offers speed advantages for large-scale operations. These findings provide actionable insights for sunflower farmers aiming to optimize crop protection practices. Results indicate that the Agras T30 drone, employing ultra-low-volume spraying, required significantly less spray solution (1,100 liters) compared to the John Deere 4630 sprayer (15,100 liters), thereby demonstrating greater resource efficiency. Furthermore, the drone exhibited superior precision, minimizing chemical drift and promoting sustainable agricultural practices. However, the John Deere 4630 sprayer completed the application in half the time (3.5 hours compared to 7 hours), highlighting its suitability for time-sensitive, large-scale operations. This study underscores the advantages and limitations of each method, offering critical insights for optimizing fungicide application strategies based on specific agronomic and operational requirements.

Key words: drone spraying efficiency, precision agriculture