

Title Investigating the performance of thermonebulisation fungicide fogging system for loaded fruit storage room using CFD model

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Abstract

To study the operation of postharvest storage fungicide fogging systems, a CFD model was used. The modelling was based on an Eulerian–Lagrangian multiphase flow model. The effect of air circulation rate, circulation interval, bin design, stacking pattern and room design on deposition of fungicide was investigated. Air circulation rates of $0 \text{ m}^3 \text{ h}^{-1}$ (no circulation), 2100 and $6800 \text{ m}^3 \text{ h}^{-1}$ were used. Interval circulation of air was also investigated. The highest fungicide deposition was observed during fogging without circulation while the lowest deposition corresponded to fogging with the highest circulation rate. For the considered on/off combination times, the effect of circulation interval on overall average deposition and uniformity was not significantly different from the case of fogging with continuous air circulation. Bin with higher vent hole ratio and the presence of air deflector increased the amount and uniformity of deposition. Good agreement was found between measured and predicted results of deposition of fungicide particles.