

Numerical simulation of spray ejection from flat fan nozzles for agrochemical application: validation of drift

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Summary

In the present work, the extent of drift from spray ejection was simulated and validated using HARDITM ISO F110-03 type flat fan nozzles, both in wind tunnel and in the field, in accordance with the ISO 22866 (2005) standard. After model validation, a virtual field spraying application was carried out for 65.5 s, georeferencing a specific batch, considering a sprayer with ten HARDITM ISO F110-03 flat fan nozzles, with a forward rectilinear and uniform speed of 2.22 m/s. A binary collision model of droplets, with solid core droplet evaporation and the meteorological conditions recorded in the field was used. At the end of the process, the simulation recorded 8.72% of the volume in suspension, reaching a maximum height of 5.2 m. In addition, evaporation of 136,301 droplets was recorded, where 31 droplets left the simulation domain, after having traveled approximately 350 m from their ejection. Drifting particles smaller than 50 μm traveled a distance of 410.36 m from the application.

Key words: fluid particles; atmospheric dispersion; numerical models