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### THE EFFECT OF FAN FREQUENCY ON THE DROPLET SPRAYING SWATH OF AIR BLAST SPRAYER

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**ABSTRACT** The range of droplet deposit is influenced by wind speed of air blast sprayer. Taking the D400 air blast sprayer as the experiment platform, the spraying experiment was carried out by using concentration of 1g/L solution being of mixed colorant Rhodamine-B with water instead of pesticide. Spray test sampling region was selected to be a sector in front of the cylinder, the centre angle and the radius were 38° and 18.5m respectively. 90 sampling points were set in the region. At each sampling point, a glass slide (7.5cm × 2.5cm) was placed to collected droplets. When spraying, the power supply frequency of fan was regulated from 50Hz, 49.5Hz down to 44.5Hz, in a step of -1Hz. Each spray testing period was 30s. The droplet depositing on sampling points was calculated using the fluorescence spectrophotometer. When spraying tests were conducted under variable frequencies of 49.5Hz to 44.5Hz, test results indicated: (1) When spraying directly, an average of 97.4% of the droplets deposited between two parallel lines shift away from the wind cylinder axes was  $\pm 2$ m. (2) When wind speed was less than 0.3m/s, the influence of the outside wind on the droplet deposition in front of the spout within 8m was quite small, but outside wind made the droplets in the area scatter away from the spout (>8m) drifting along the direction of the outside wind. (3) As the fan power supply frequency was reduce, the droplet transmission distance of air blast sprayer was shortened.

**Keywords:** Air blast sprayer, Spraying swath, Droplet deposition, Variable frequency