

Droplet size analysis of the 'Stihl' motorised mistblower

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The 'Stihl' SR400 motorised mistblower (Andreas Stihl AG & Co., Waiblingen, Germany) has been used fungicide application in a number of our cocoa field trials. The droplet size spectra for a range of flow rates were measured using a particle size analyser (Malvern Instruments Ltd., Spring Lane South, Malvern, Worcestershire, UK), fitted with a 300 mm lens, using procedures described by Bateman and Alves (2000). Readings consist of 1000 scans (sub-samples) with measurements of all settings taken on two separate occasions to check for consistency. Two experimental fluids were used: water + 0.1% Agral (a non-ionic surfactant) and water + 1% emulsifiable oil adjuvant ('Codacide' oil: Microcide Ltd, Shepherds Grove, Stanton, Suffolk, UK). New Stihl mistblowers are typically fitted with a slotted, plastic baffle plate, but these are easily removed and often lost. All settings were therefore measured with and without this baffle plate present.

With the settings used in the field trials the droplet size spectrum was estimated to have a Volume Median Diameter (VMD) of 53 μ m. These were: a SR400 machine fitted with a pump and 1.0 restrictor; when calibrated with the motor operating and the nozzle directed upwards at 45 $^{\circ}$, the measured flow rate was approximately 550 ml min $^{-1}$ (see Fig. 2), delivering an estimated equivalent of 190 l ha $^{-1}$.

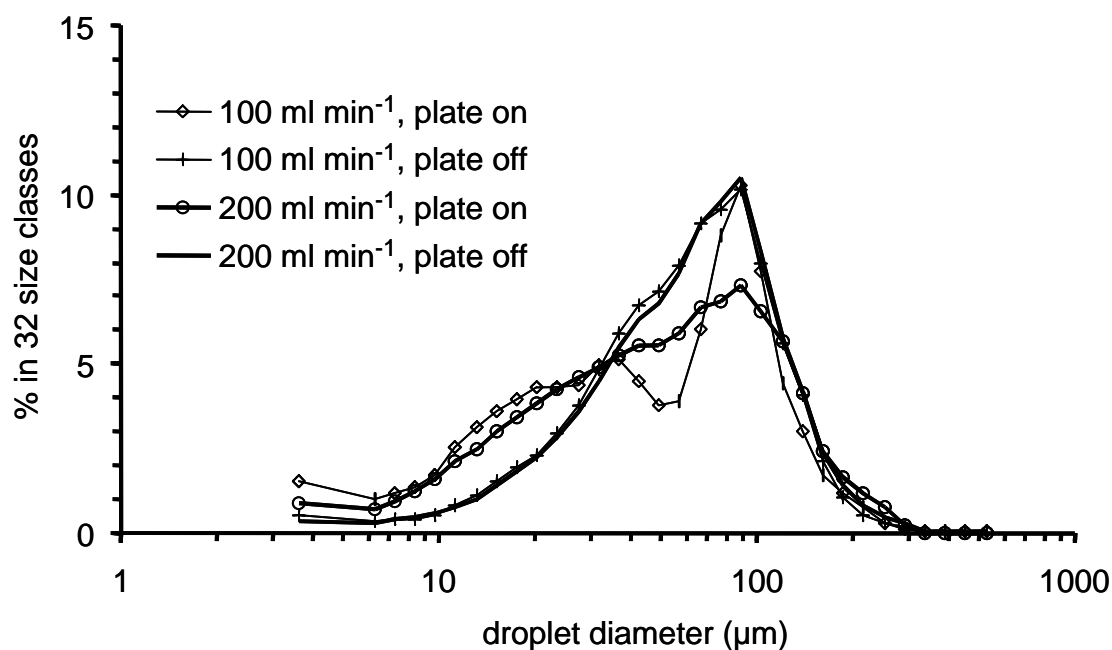


Fig. 1: Droplet spectrum analysis of a Stihl SR 400 motorised mistblower at two flow rates, with water + 0.1% Agral. The spectrum at each flow rate is shown with and without a standard, detachable baffle plate clipped to the front of the air-shear nozzle.

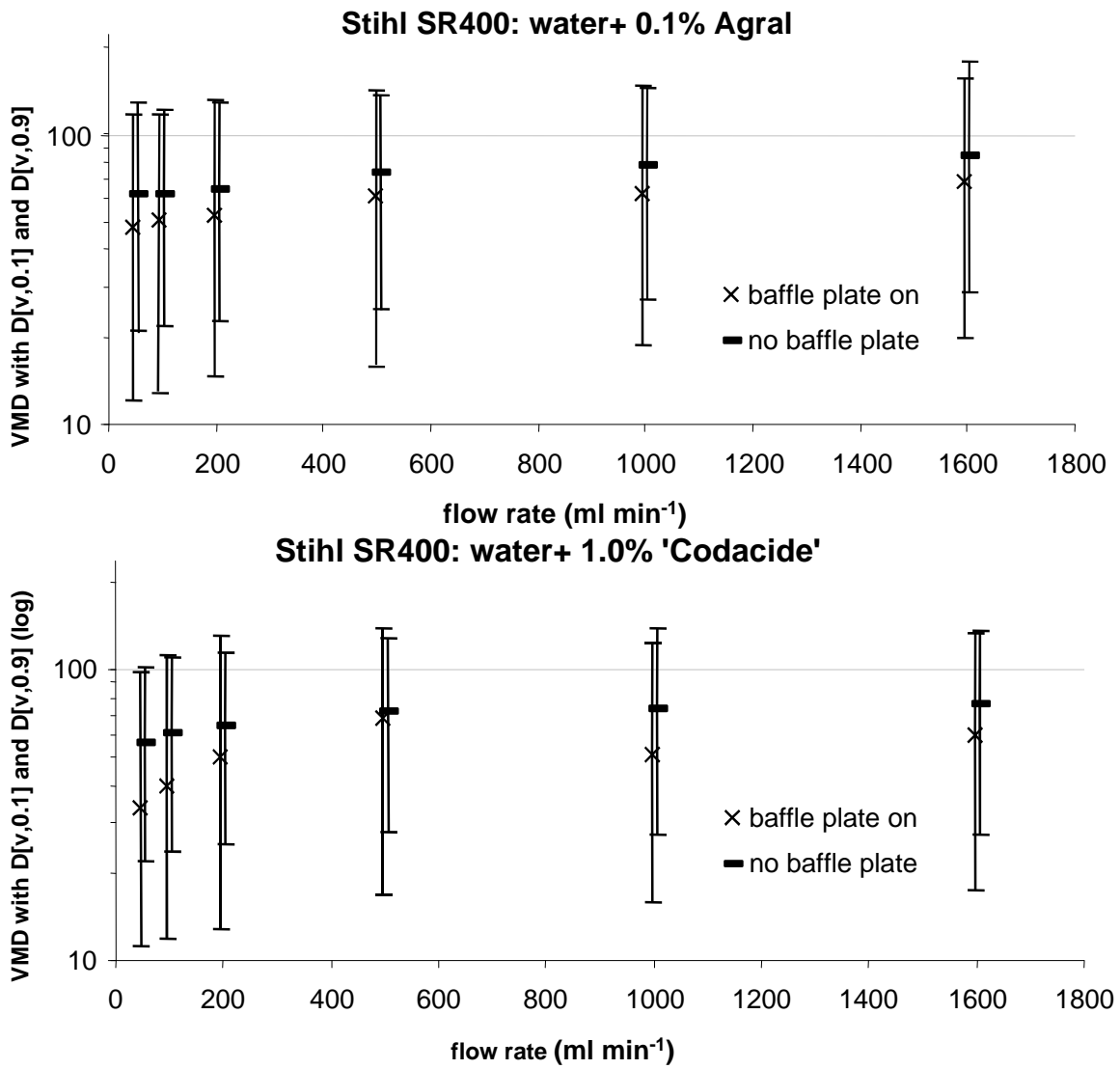


Fig. 2: Summary of droplet size spectra with two formulations at a range of flow rates