Lab scale methodology to measure formulation losses due to rain

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Abstract

Formulation can play a key role in maximizing the delivery of an agrochemical active ingredient to the target site and preventing losses from it. In this contribution we share developments in state of the art for characterising the rainfastness of a formulation. In particular we compare results from fluorescently labelled deposits on *vicia faba* leaf surfaces and demonstrate a high through-put lab-scale methodology which is predicative of performance in a full scale raintower without the need for liquid chromatography and mass spectrometry analysis.

Methodology

Leaves were fixed to glass-slides and 0.2 µL droplets of fluorescently labeled PVA (0.4% w/w) or a model fluorescent active ingredient (Azoxystrobin) were placed on the adaxial leaf surface and allowed to dry. The deposit was imaged under a fluorescent microscope (Leica MZ10 F, fitted with an 'ET GFP' filter, camera and fibre optic light source) and then washed either by 1 mL of DI water from a burette or by a full-scale raintower to simulate rain.

The deposit was sequentially imaged and washed and the resulting mages were processed using ImageJ software to determine the coverage of the fluorescent polymer/model compound deposit.

Results and Discussion

The raintower and novel lab washing methods correlate well thus enabling use of the lab-scale method as a tool study the impact of co-formulants on deposit formation. Here the dependence of rainfastness on the molecular weight and crystalinity of PVA is presented and the new methodology used to show Chitosan is a particularly good example of a rainfastness adjuvant.

References

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