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The Role of Spray Volume on the Biodelivery of SC, SE and OD Formulations: What We Know and Do not yet Know.

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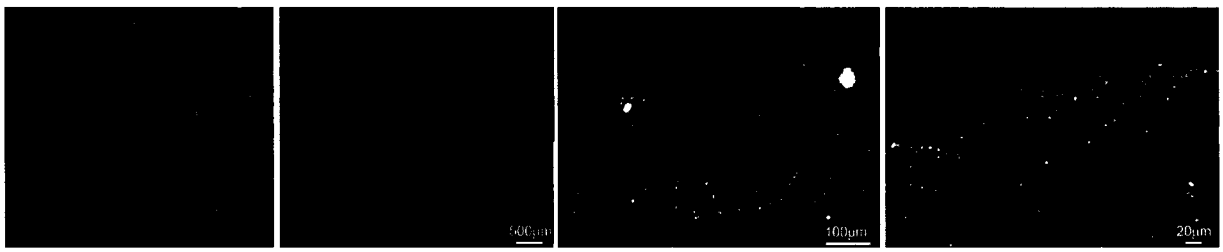
Today application practices throughout the world are highly diverse, for example spray volumes range from tens of litres per hectare in some countries to hundreds or thousands of litres in others. Interestingly, with formulations used globally differences in performance can be observed between certain countries. However, it has been difficult to understand the cause of these differences due to the high number of factors involved.

Over the last 10-15 years our understanding of the wetting of micro-structured surfaces such as leaves has dramatically advanced. In parallel the importance of the deposit microstructure, especially in the presence of adjuvants has also become evident. These advances combined with developments in the design of flowables formulations offer opportunities in the design and development of products with potentially new levels of performance.

Key to achieving effective biodelivery is the control of the interfacial wetting properties, both dynamic and static for different leaf types, the resulting coverage and distribution of the spray on the leaf surface and then the microstructure and distribution of the a.i. and adjuvants on dry-down. The biodelivery of plant mobile actives is then a function of the distribution of the spray deposits on the leaf and of the microstructure of the spray deposits while for 'contact' actives the 'bioavailability' is a function of the distribution on the target crop.

When formulations are diluted for spray application the dose is normally fixed per hectare, including all the formulants and adjuvants it contains. However, the concentration of these will vary as the volume of water applied changes and consequently spray volume is an important factor in the wetting properties and coverage of the crop and flexibility in spray volumes therefore becomes an important requirement for the realisation of these opportunities for SC, SE and OD formulations.

The presentation will cover the different steps in the delivery of spray drops to the target crop, the dependence on water volume, what information we know and what information we do not yet know.



Examination of spray deposits at increasing magnification reveals their fascinating complexity. Understanding how spray deposits form and the role of their microstructure is important for understanding how to design formulations with enhanced biodelivery.