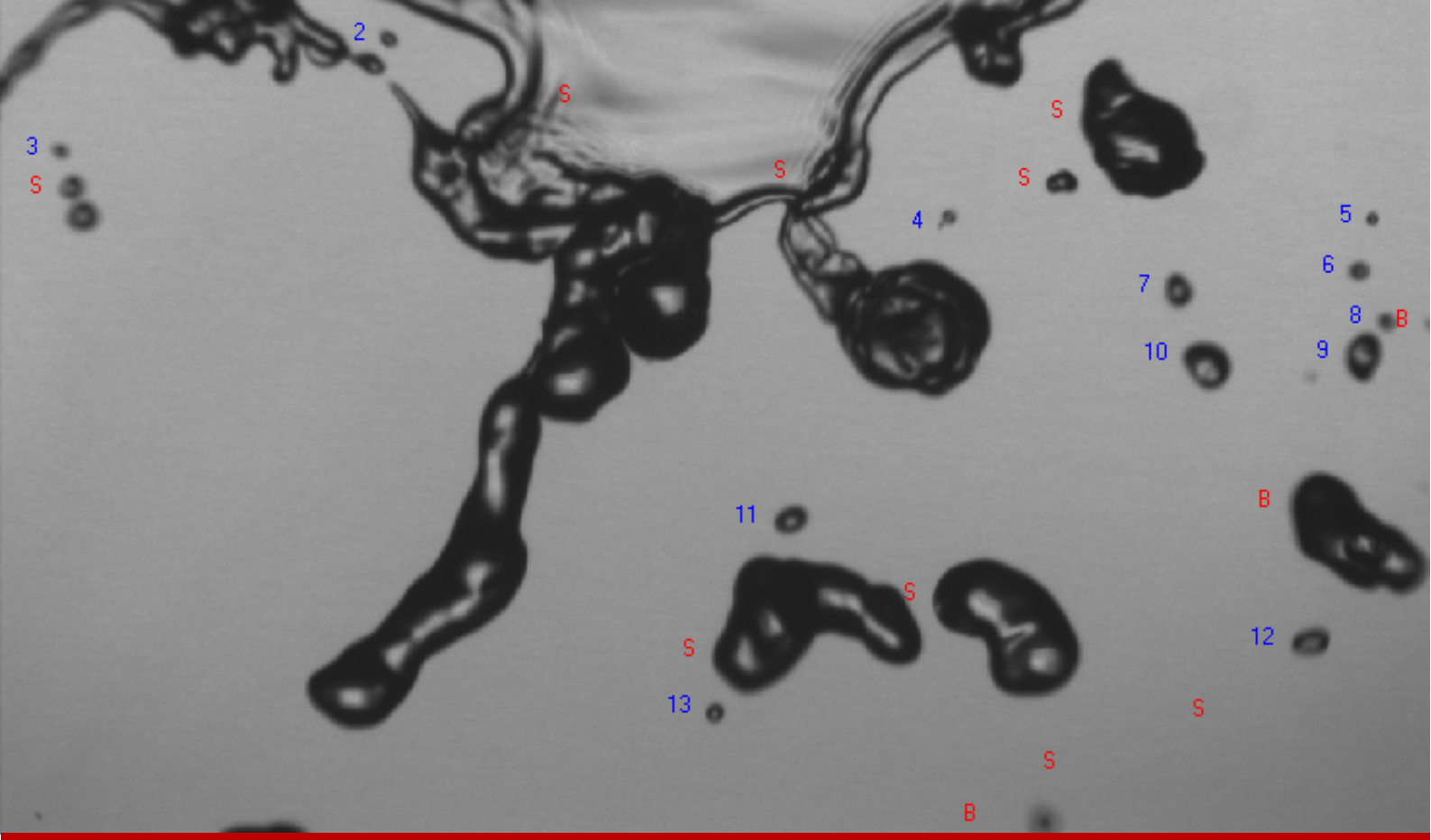


From the nozzle to the leaf

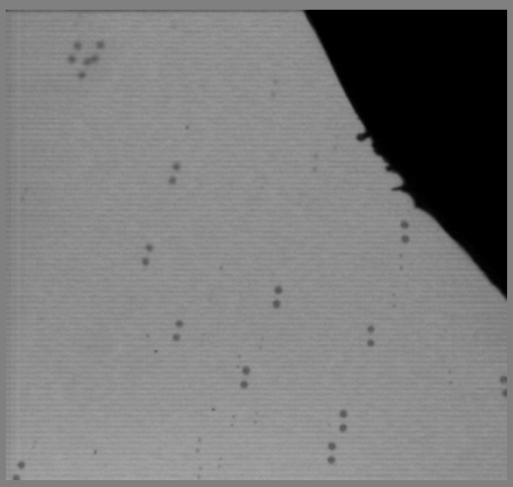
Particle sizing for spray development

OXFORD LASERS
IMAGING DIVISION

From the nozzle to the leaf…

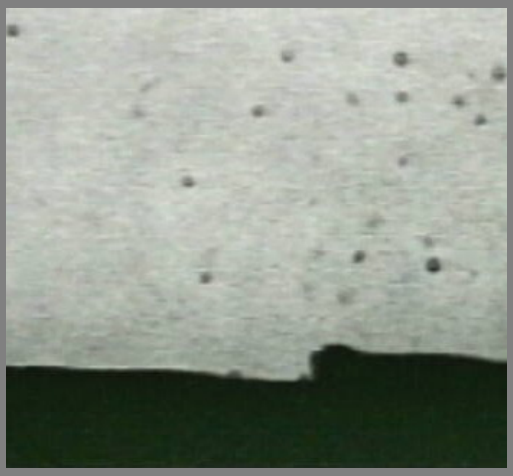
Visisize particle sizing systems are a versatile tool to help you fully characterise your sprayer or formulation. Here we discuss its application to pesticide sprayer development

As the spray leaves the nozzle, it commonly forms a sheet of liquid which then breaks up into ligaments and finally droplets. The imaging capability of a Visisize system lets you freeze the motion of the sheet and get a crystal-clear picture of what's happening.



Rotary bell atomisers produce very fine mists of high-speed droplets. A VisiSize N60 system was used to capture pairs of images of the droplets as they leave the bell (and then measure their size and velocity).

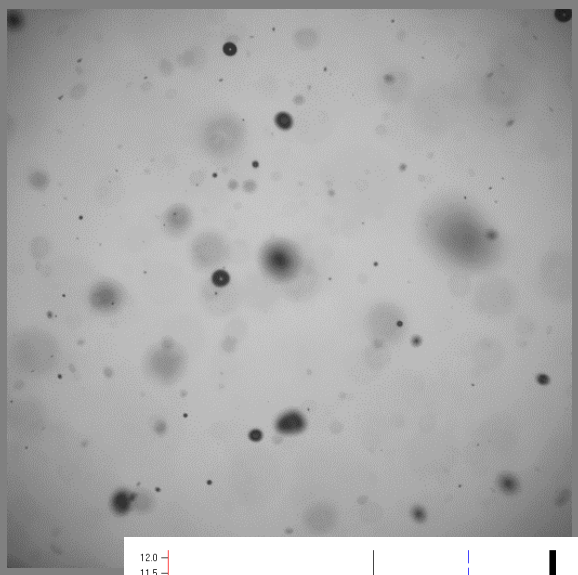
Once the droplets are in flight, VisiSize systems can measure their size and velocity. Here, an image of a droplet from an air-inclusion nozzle has been captured. These nozzles are difficult for diffraction-based particle sizing systems to measure, but not VisiSize.



Once the spray droplets arrive at the leaf, a VisiSize system lets you see how they impact. The freeze-frame images let you see droplets impact, and the size and velocity analysis let you record how much of the liquid splashes off the leaf again.

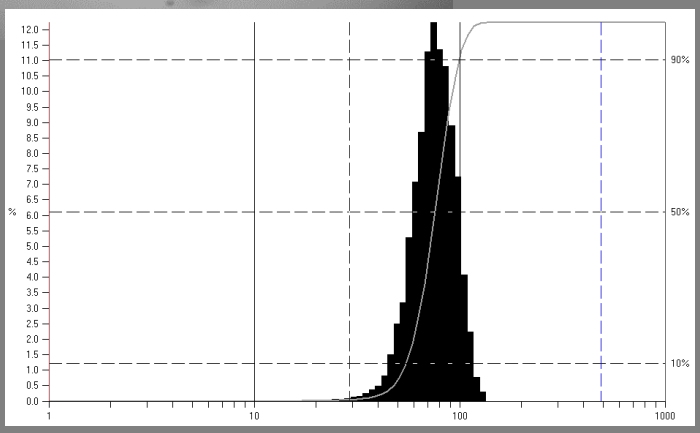
Apr 2012

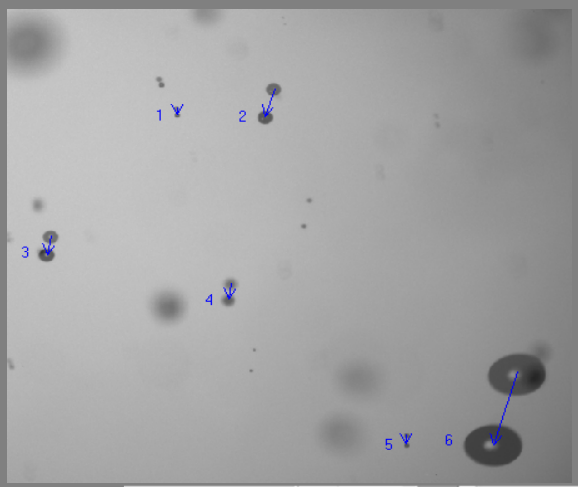
Powerful Software



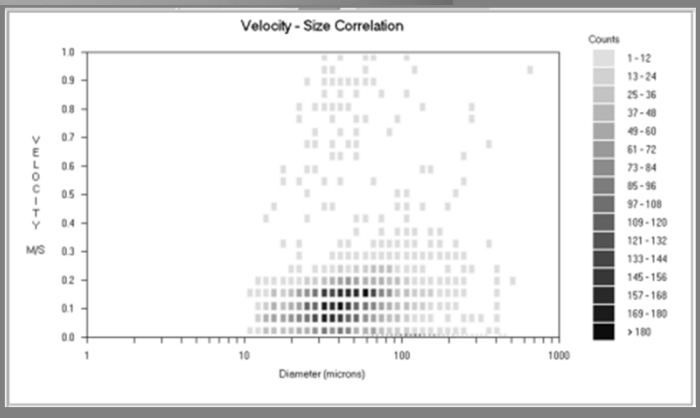
Visisize particle sizing software analyses the images of droplets in real-time and reports on their diameter. This means that you can see the droplet size distribution build up as the droplets pass the camera. Visisize reports all the measurements that you would expect from a best-in-class particle sizing instrument including:

Mean diameter (by number, area or volume); Sauter mean diameter; 10%, 50% and 90% volume percentiles; Deviation; Relative span; Absolute concentration.





With the velocity function enabled, Visisize systems will simultaneously measure and report the particle size and velocity. This means that you can see what velocity different sizes of droplets are moving at. You can understand whether flow from your nozzle is dominated by fast or slow droplets, what direction they are travelling in, and what their mean diameter is.



Splash-proof camera enclosure and illumination optics means that the measurement head can be placed inside the spray, without affecting the measurement.

Measure individual particles to build up characteristic spray drop size distribution. Infrequent large droplets are not ignored.

Real-time, online measurement means that you can see the droplet size distribution build up as particles are analysed.

System	Visisize Portable	Visisize D30	Visisize N60	Visisize S100
Application	Analysis of sprays in a portable, cost-effective package	Sizing analysis of sprays in a cost-effective package	Sizing analysis of fast-moving small droplets	Difficult and transient spray research made easy
Velocity/ Direction	No	Option	Option	Option
Size Range	>15µm	>5µm	>2µm	>3µm
Dynamic Range	125	125	200	150
Typical Working Distance	Fixed position within instrument	40mm to 1500mm (subject to lens option)		
Maximum particle velocity (50µm diameter particle)	15m/s	15m/s	1500m/s	1000m/s
Image Source	Online. High resolution camera, up to 15,000 particles/second in real-time mode.			Stored Images
Spray protection	Splash-proof enclosure (IP54) suitable for use within sprays.	Splash-proof (IP54) or spray-proof (IP66) enclosure for use within sprays		
System Dimensions	750 x 225 x 85mm	Measurement head: 1500 x 150 x 200mm		

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