VEGEPHY : How the use of oligosaccharides impact the quality of spray applications

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The use of oligosaccharides was tested in combination with water to determine how they impact the quality of spray applications and could improve the quality of treatment.

The break-up of a liquid stream occurs as aerodynamic instabilities in the liquid-air interface are amplified. An initial fragmentation breaks the sheet into ligaments, and a second fragmentation then reduces the ligaments to droplets. The size of the droplets formed depends on the composition of the fluid.

At the nozzle, a liquid stream or sheet is not yet fragmented, other than in water, where significant surface instability occurs on exit from the nozzle. Further away from the nozzle exit, ligaments are formed. Individual droplets then form gradually as the ligaments break up. The addition of polysaccharides stabilises the flow and slows the break-up of the sheet (Fig. 1)

The use of oligosaccharides increases the size of the spray droplets (Fig. 2), which affects the spatial distribution of the treatment, but reduces the risk of drift.

The speed of each droplet could be in relation to the diameter (Fig. 3). The faster is the speed and the larger is the diameter of a droplet, the greater is the risk that it would rebound and fragment on splashing. The use of oligosaccharides limits this tendency to the extent that, when the droplet reach its target, it attaches to it more effectively, improving the overall yield from spraying by reducing ground loss.

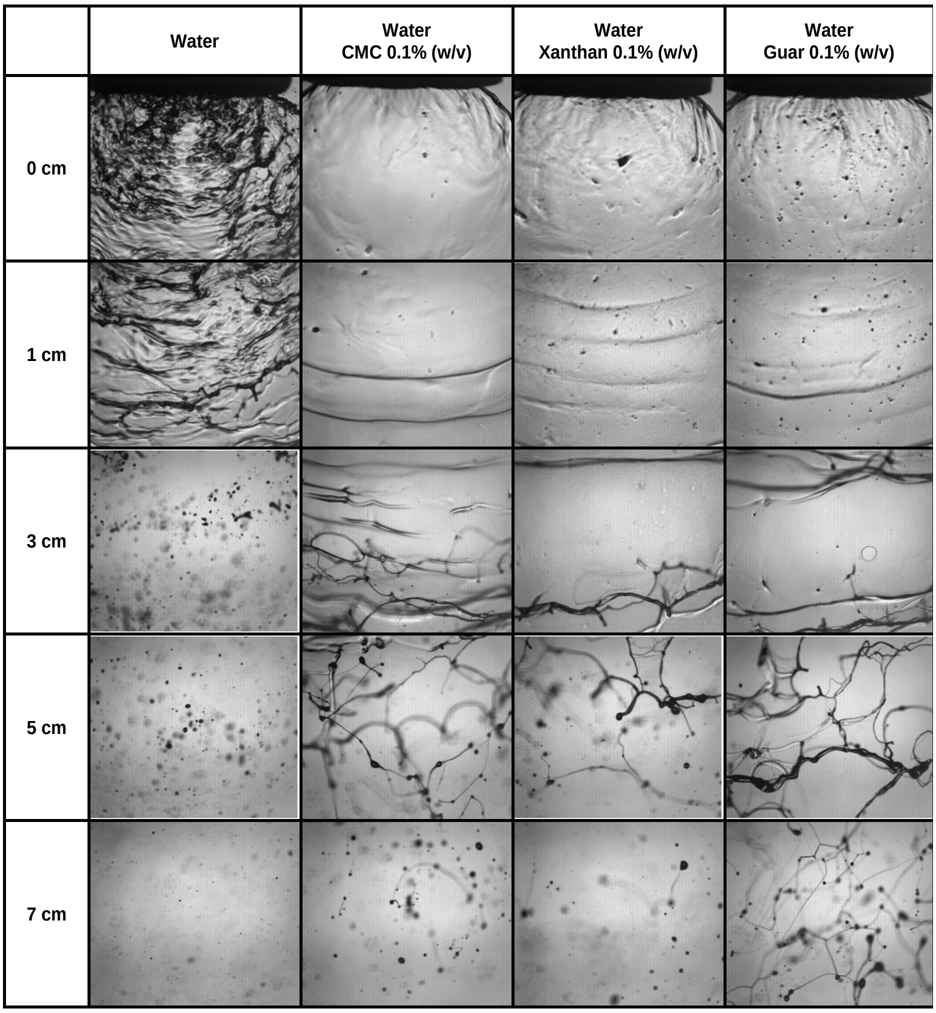

Fig. 1

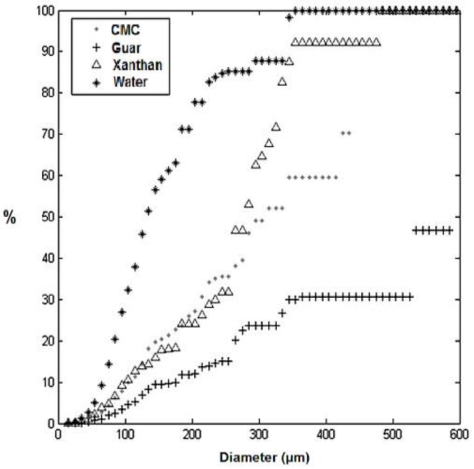

Fig. 2

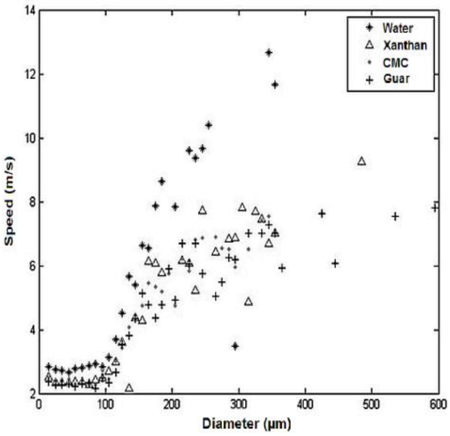

Fig. 3

Fig. 1 Change in the break-up of the liquid stream based on distance (0, 1, 3, 5 and 7 cm) from the nozzle (a Teejet 11003) for water only (control) and for carboxymethyl cellulose (CMC), xanthan and guar in water at 0.1% (w/v).

Fig. 2 Cumulative droplet volume percentage, based on diameter. Each point corresponds to the class average diameter for water alone (Water) or for carboxymethyl cellulose (CMC), xanthan or guar at 0.1% (w/v) aqueous solution.

Fig. 3 Change in speed in relation to droplet diameter for all four products. Each point corresponds to the class average diameter for water alone (Water) or for carboxymethyl cellulose (CMC), xanthan or guar at 0.1% (w/v) aqueous solution

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