

Krish Shanmuga, Rajesh Goyal and Michelle McKnight, and ° Benoit Abrisbat (SOLVAY)

There has been a growing concern with the off-target movement of pesticide fines from the target site. The drift of spray from pesticide applications can expose people, wildlife, and the environment to pesticide residues that can cause health and environmental effects, and property damage. Many of the regulatory bodies around the world, who regulate the use of pesticides, have been actively engaged in broadening our understanding of the science and the predictability of spray drift based on new studies and in helping the pesticide applicators to reduce spray drift by improving product label use directions

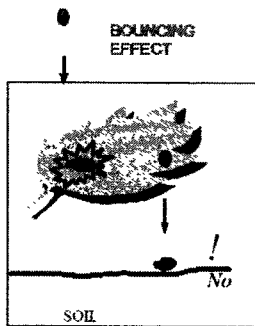
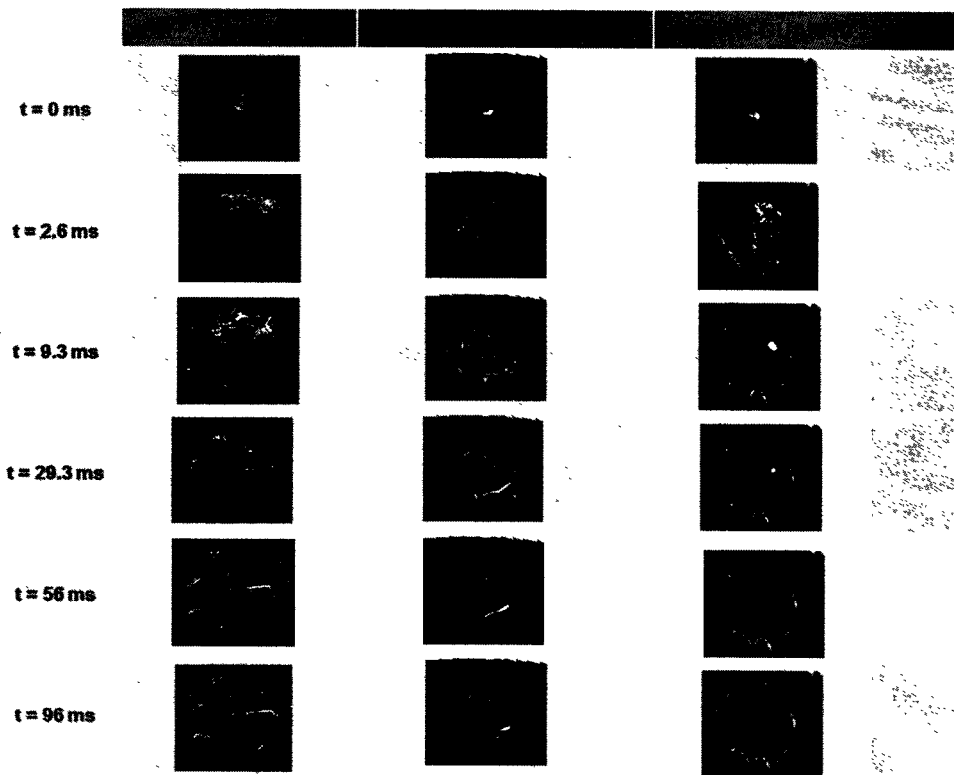
Guar polymer and its derivatives, which are plant based, have been in use as spray drift control adjuvant for over 15 years. Guar polymer has been known to provide good drift control benefits while providing anti-rebound and rainfastness benefits as well. Guar is traditionally sold in dry powder form and care must be taken to disperse the polymer into water because of its tendency to hydrate and form fish eyes if the mixing process is not followed appropriately. To overcome this issue guar based water soluble granule (WSG) with improved dispersion was developed. However, it would be desirable to provide a liquid concentrate that has high guar content and that could simply be diluted to the desired end use concentration. There is a continuing interest in providing drift control polymer in a convenient form that exhibits good handling properties, good storage stability, easy to incorporate into the spray solution while providing same or better drift control benefits

The development of flowable formulations of guar (aqueous and non-aqueous) not only addresses the limitations of dry guar products but also provides us a way to come up with multi-purpose spray adjuvants that has the benefits of enhancing pesticidal efficacy, water conditioning, wetting, spreading in addition to providing the desired spray drift control benefits.

Guar and guar derivatives used as drift control agents, in agricultural spray applications, are cold water soluble and have high molecular weight (typically 2×10^6 g/mole) which limits the ability to load high concentration of guar in aqueous based adjuvant formulations. We have overcome this challenge by controlling guar hydration through proper choice of formulation components. Oil based flowable guar formulation on the hand offers a different challenge where guar does not hydrate however, suspending guar and obtaining a formulation with long term shelf stability was difficult to achieve. Through proper choice of rheology additives and processing we were able to successfully prepare oil (vegetable oil and methylated seed oil) based flowable guar formulations with acceptable stability. Also, with this new approach we were able to prepare different types of pesticide formulations with built-in with guar polymer that exhibited good drift control in addition to providing good tank mix compatibility

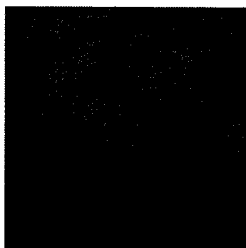
Here we present the preparation of flowable guar formulations, their physical stability and dispersion in water, and the spray characteristics of the tank mix containing our formulation. Both water based and oil based guar formulations are covered and the potential to load guar in built-in pesticide formulations also has been demonstrated.

Droplet bouncing



FORMULATION FAILS TO REMAIN ON TARGET

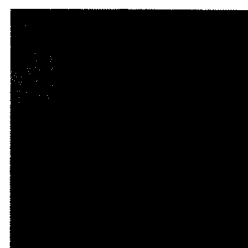
Guar: Spray pattern



Blank (Roundup Powermax +AMS)



Game-1200 (0.5wt%)



Starguar