Spray and Stick: A Novel Agent for Pesticide Adhesion

Wu, Jacob (School: The Lawrenceville School)

Pesticide runoff is a major challenge facing the agricultural and landscape industries today. The vast majority of sprayed pesticides end up in an environment other than their intended destination, and this unwanted pollution can lead to highly detrimental environmental effects. My research aims to determine an effective method to improve pesticide retention on plant surfaces. Through a series of experiments, I develop a novel solution comprised of selected amphoteric surfactants and shear-thinning polymers, in order to reduce the surface tension of spray droplets, while increasing surface energy and droplet adhesion. To assess the effectiveness of the solution, I evaluate spreadability using contact angle measurements of droplets, while retention of droplets is determined through adhesion testing. Results revealed that the retention rates of my solution are more than double those of controls. This novel approach has numerous advantages: my solution uses natural, biodegradable ingredients, is low cost, can easily be implemented with existing pesticides or similar sprays, and most importantly, results in significantly reduced pesticide runoff.

Awards Won:

Fourth Award of $500

Patent and Trademark Office Society: Second Award of $500

National Security Agency Research Directorate : Honorable Mention "Material Science"