

Westchester Chemical Society
New York Section of the American Chemical Society

**THE DISTINGUISHED SCIENTIST AWARD AND DINNER,
AND THE STUDENT ACHIEVEMENT AWARDS**

WEDNESDAY, MAY 12, 2021

Lecture and Awards by Cloud HD Video 7:00 p.m.

Trisiloxane Alkoxylates as Adjuvants for Agriculture

George A. Policello

Research Fellow

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DISTINGUISHED SCIENTIST 2021:

Mr. George Policello for *Contributions to the Development of Trisiloxane Alkoxylates in Agriculture*

Mr. Policello had been selected as our 2020 Distinguished Scientist. Because of the Covid-19 pandemic, the Westchester Chemical Society Board Of Directors decided to postpone the award until 2021. Unfortunately, as the pandemic continues, the 2021 awards meeting will be a Cloud HD Meeting.

ABSTRACT:

Trisiloxane-based surfactants have been used for over 35 years as spray adjuvants for agricultural applications. Relative to conventional adjuvants, trisiloxane surfactants provide an extremely low aqueous surface tension (~21 mN/m at 0.1%). This surface activity, coupled with a compact hydrophobe (trisiloxane portion of the molecule), makes these unique surfactants “Super-spreaders”, where the spray droplet is transformed into a thin film on the leaf surface. Therefore, trisiloxane solutions easily wet almost any waxy leaf surface, and the overall coverage on a target plant is significantly increased. This results in spray volume reductions of up to 90%, benefiting areas where water is in short supply. Additionally, a reduction in water usage allows the grower to treat more acres per tank-load, thereby saving time, labor and energy.



Another extraordinary property of trisiloxane surfactants is their ability to promote rapid uptake of spray solutions via stomatal flooding in as little as 20 seconds. Active ingredients taken up into the plant via this pathway become immediately rainfast (resistant to wash-off), thereby reducing waste, and in some cases allowing for a reduction in pesticide usage.

Silwet L-77 adjuvant was the first trisiloxane-based surfactant developed for agricultural applications. This unique class of “Super-spreading” wetting agents was introduced into agriculture in 1985, in response to the inability of many herbicides to control gorse (*Ulex europaeus*), a noxious invasive weed in New Zealand. Union Carbide, in collaboration with the Forest Research Institute in NZ, quickly realized that Silwet L-77 adjuvant significantly enhanced the performance of herbicides that were previously incapable of controlling gorse. In fact, only Silwet L-77 adjuvant had the ability to effectively wet the waxy surface of gorse, thereby enabling a 70% reduction in pesticide requirements, while delivering effective control.

This presentation will detail the historical development of “Super-spreading” trisiloxane-based wetting agents, including examples illustrating how commercial growers use such surfactants as a regular part of their spray program, including their use in organic farming.

BIOGRAPHY:

George Policello is a Technology Research Fellow with Momentive Performance Materials, in Tarrytown, NY. His primary responsibilities include the direction of new product development and platform technology research programs focused on agricultural applications that enable decreased agricultural spray volumes, reduced active ingredient dosage, and improved spray control and efficiency.

George began his career in 1980 with Union Carbide in Tarrytown, focusing on the synthesis of organomodified silicones for a broad range of applications, including coatings, textiles and personal care. In 1985 he joined Lever Research in Edgewater NJ, where he studied the interactions between polyether-modified silicone surfactants and conventional wetting agents. He rejoined Union Carbide in 1987 (subsequently Crompton Corporation, OSi Specialties, GE Silicones, and Momentive Performance Materials) where he has since been responsible for the development of silicone surfactants, specifically trisiloxane alkoxylates as agricultural spray adjuvants. George has contributed to the understanding of the super spreading mechanism associated with these unique surfactants, as well as the role of spreading on the uptake and efficacy of agrochemicals on and into foliar surfaces. Additionally, his research on surfactant-pair interactions between trisiloxane alkoxylates and conventional surfactants has added to the understanding of how dynamic surface tension influences spray droplet adhesion on leaf surfaces.

George graduated from Mercy College in Dobbs Ferry, NY in 1979 with a Bachelor of Science degree in Biology. He holds more than 45 patents related to silicone surfactants and agricultural applications, and is the author of more than 70 external publications and presentations. Additionally George has been involved with the Silicones Environmental Health and Safety Council (SEHSC), and the Counsel of Producers & Distributors of Agrotechnology (CPDA).

Date: Wednesday, May 12, 2021
Time: 7:00 PM

Place: Cloud HD Video Meeting using a Zoom Cloud PlatformD

Dr. Rolande Hodel, Co-Chair of the Westchester Chemical Society is inviting you to a scheduled Cloud HD Video meeting for our Distinguished Scientist 2021 and 2021 Student Awards

Distinguished Scientist: George Policello

Topic: Trisiloxane Alkoxyates as Adjuvants for Agriculture

Time: May 12, 2021 06:45 PM Eastern Time (US and Canada)

No password needed.

Join URL: [Join our Cloud HD Video Meeting](https://sunnywcc-edu.zoom.us/j/81235674781)

<https://sunnywcc-edu.zoom.us/j/81235674781>

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For further information: contact Rolande Hodel, rrhodel@aol.com,
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Please RSVP by text or email to Rolande Hodel, Peter Corfield or Paul Dillon if you expect to come, to help us plan. But if you do not RSVP, you can still link in.

Please note that screen prints of the Zoom screen may be taken at the meeting and may be submitted for publication in the NY/North Jersey newsletter, The Indicator. If you do not want a photo of yourself submitted, let us know at the meeting