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LOCKWOOD LECTURE

“Engineering Nanomaterial Properties for Applications in Agriculture”



Gregory Lowry, PhD

Walter J. Blenko, Sr. Professor of Civil & Environmental Engineering
Carnegie Mellon University, Pittsburgh, PA

Tuesday, June 13, 2017

Tea: 10:30 a.m., Lecture: 11:00 a.m.

**Jones Auditorium, The Connecticut Agricultural Experiment Station
123 Huntington Street, New Haven, CT**

Incomplete understanding of how a nanomaterial’s properties control its activity, fate, and bioavailability in agricultural systems hinders development of novel applications, e.g. agrochemical delivery. Dr. Lowry’s current research aims to develop a more fundamental understanding of how the nanomaterial properties and the system properties together affect nanomaterial transformations, behaviors in soil, and interactions with aquatic and terrestrial plants. Using synchrotron X-ray analysis, the spatial distribution and speciation of metal and metal oxide NPs in living samples of aquatic and terrestrial plants is used to determine how nanomaterial charge and solubility can be manipulated to control uptake and translocation of NMs in terrestrial and aquatic plants. Methods to measure CuO nanoparticle dissolution in soils and correlating dissolution rate with plant nutrient utilization efficiency are also presented. Overall, the body of evidence indicates great potential for manipulating nanomaterial properties for beneficial applications in agriculture and for increasing agrochemical utilization efficiency and sustainability of food production.

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