Nano-enabled agriculture: A path to global food security in a changing climate

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Low use and delivery efficiency of conventional agrichemicals is a significant impediment to maintaining global food security, particularly given that a 60-70% increase in food production is needed by 2050 to support the projected population. Further confounding these efforts is a changing climate, which will force increased cultivation of crops under more marginal and stress-inducing conditions. We are using nanotechnology as a novel and sustainable strategy to increase the delivery efficiency and efficacy of nutrients and pesticides, as well as to promote increased resilience to biotic and abiotic stresses. Driving this effort is a focus on harnessing our ability effectively tune nanoscale material structure and composition to maximize benefit, increase food security and reduce the impact of agriculture on the environment.