A NEW DELIVERY ROUTE FOR PLANT NUTRIENTS

Civil and environmental engineering researchers from the College of Engineering have found a way to deliver nanoparticles into plant leaves so that they successfully travel from the leaf to the root. This is a game-changing technology for the future of agriculture. Currently, the majority of agrochemicals like nutrients and pesticides never reach their destination and are wasted. Nanoparticle delivery through leaves could be a nearly 100% efficient process for delivering nutrients, antibiotics, and other agrochemicals.

Agrochemical delivery through leaves provides

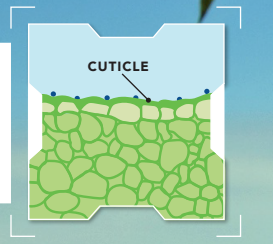
- Nearly 100% efficient nutrient and antibiotic delivery
- A way to better manage stresses due to extreme climate
- Protection against disease
- Energy and cost savings
- Increased crop yield

Read more about research for the future of agriculture at www.engineering.cmu.edu

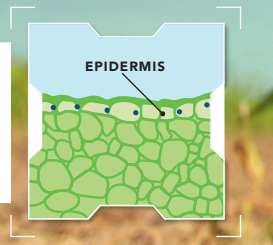
Carnegie Mellon University
College of Engineering

1 The engineered nanoparticle, coated in a polymer, is sprayed onto the leaf.

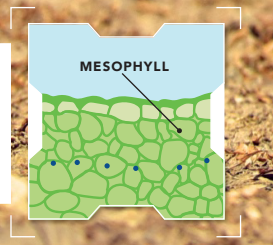
2 It moves through the cuticle, or the waxy outer layer that protects the leaf from harm.



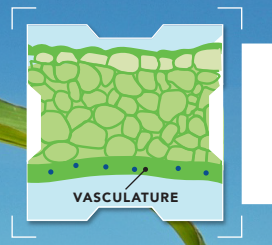
3 Then it crosses the epidermis, another protective layer that prevents water loss and allows gas exchange.



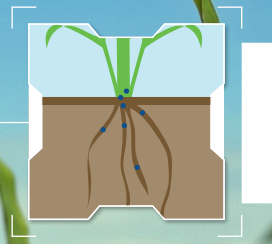
4 Once in the epidermis it moves through the mesophyll, which is the inner leaf tissue.



5 From the mesophyll it enters the vasculature, or the plant's veins.



6 It travels through the phloem down to the roots.



7 From the roots it can be exuded into the soil.