The Connecticut Agricultural Experiment Station

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The Connecticut Agricultural Experiment Station receives $747,602 USDA National Institute of Food and Agriculture (NIFA) grant to investigate functions of microbiome on apple flowers in fruit development and disease resistance

New Haven, CT - The USDA National Institute of Food and Agriculture (NIFA) has awarded Dr. Quan Zeng and Dr. Blaire Steven of The Connecticut Agricultural Experiment Station (CAES) a three-year $747,602 grant to characterize the functions of flower microbiome on fruit development and disease resistance of apple.

Flowers are the reproductive organs of most plants and have great significance for agriculture. While flowers produce nutrient-rich secretions (nectars and stigma exudates) to attract pollinators and facilitate pollen germination, such secretions also support the growth of large number of microorganisms, both beneficial and pathogenic, referred to collectively as the microbiome. In this project, scientists from CAES aim to understand how a flower assembles its microbiome during its life span, and how the microbiome impacts plant phenotypes such as fruit development, pollinator attraction, and resistance to plant diseases. "We found that a few days after petal open, the microbiome on each individual flower could be characterized into one of the three 'signature states' said Dr. Blaire Steven, Associate Scientist at CAES. "Under natural conditions, only about 60% of flowers become pollinated and developed into fruitlets, while others will wither and die. We will investigate if being in one of the three signature states is associated with a flower's fate later in life." "When encountering plant pathogens, some flowers are more susceptible than others, even they are all from the same tree", said Dr. Quan Zeng, an Associate Plant Pathologist at CAES. Dr. Zeng notes that "we will determine if differences in their microbiome are a potential cause of such variations". "If we can better understand what those microbes are doing on the plant, we may be able to better harness them towards helping plants to secure nutrients, attract pollinators, and resist diseases, thus producing more agricultural outputs, with reduced chemical inputs" said Dr. Zeng.

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