Developing the infrastructure for precision agriculture was not only important to improve farming efficiency for the production agriculture acreage on the UMES campus, but for involving students through appropriate coursework and field based experiential learning endeavors to this rapidly advancing multidisciplinary field that embodies the core values of its land-grant mission.

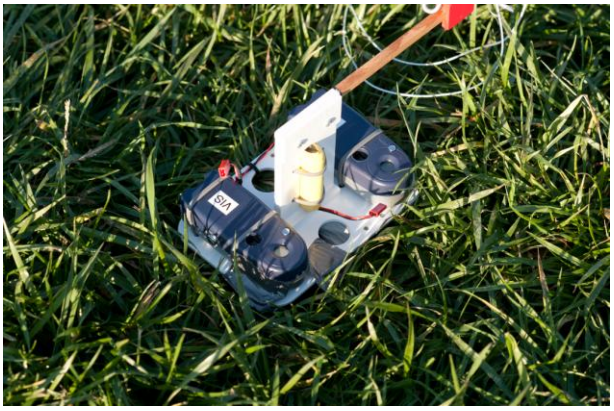
Environmentally Conscious Precision Agriculture (ECPA) - A Platform for Active Learning and Community Engagement

Who cares and why?

"Precision Agriculture" has been identified as an efficient approach for coping with the food demands of a growing population in an environmentally friendly manner. Agricultural needs and environmental concerns are of critical importance in the rural environment of the setting of University of Maryland Eastern Shore (UMES) and its proximity to the Chesapeake Bay. Developing the infrastructure for precision agriculture is not only important to improve farming efficiency for the production agriculture acreage on UMES campus, but for involving students through appropriate coursework and field based experiential learning endeavors to this rapidly advancing multidisciplinary field that embodies the core values of its land-grant mission.

What has the project done so far?

A course titled “Advanced Technologies in Agriculture and Environmental Sciences” was developed immediately after the award of the grant and was offered every spring semester for the first two years and then for every alternate spring semester. More than 70 STEAM students were exposed to the precision agriculture-related efforts at UMES through the course and related experiential learning projects. More than 50% of these students were from the minority population. Maryland Space Grant Consortium (MDSGC) and NASA provided annual student support for synergistic proposals developed by the PI titled AIRSPACES: “Aerial Imaging and Remote Sensing for Precision Agriculture and Environmental Stewardship”. Two graduate students at UMES have completed their master’s thesis on topics related to precision agriculture. One of them was



supported by MDSGC and the other by the USDA Evans-Allen Grant. The project efforts have paved the way for continued support related to environmentally friendly precision agriculture by the Capacity Building Grant (CBG) Program that is currently ongoing on campus. More than 15 students continue to work every semester in a vertically integrated multidisciplinary team to support the project leaders as well as a graduate student who is working on his dissertation work on a related topic with the PI.

Impact Statement

The ECPA and AIRSPACES projects have provided a multidisciplinary platform for a team of faculty, students and staff from across the Science, Technology, Engineering, Agriculture, and Mathematics (STEAM) disciplines to explore exciting and innovative ideas that promote the core values of the land grant mission of University of Maryland Eastern Shore (UMES). Initial efforts in developing a course and exposing STEAM students to this new, innovative, and technology intensive field have attracted graduate students to pursue masters and dissertation work in "precision agriculture" and related fields. This has also allowed the project leaders to develop additional proposals that have been subsequently supported by the USDA CBG program to grow the efforts.

What research is needed?

On a future endeavor, the team has initiated collaboration with Pioneer Hybrid International to conduct field experiments with their AQUAMAX drought tolerant corn seeds. The on-the-go variable rate nutrient application capability based on optical sensor feedback will be developed on campus to enhance the precision agriculture infra-structure to explore nitrogen use efficiency(NUE) and water use efficiency (WUE) for cereal crops through field experiments.

Want to know more?

Abhijit Nagchaudhuri, Ph.D.
410-651-6479
anagchaudhuri@umes.edu

Strategic Priority: Precision Agriculture; Environmental stewardship through sustainable management practices
Additional Link: http://www.umes.edu/ard/Default.aspx?id=46285
Year and Institution: 2014, University of Maryland Eastern Shore

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