Site-specific crop management, commonly known as precision agriculture, holds significant potential for agriculture. Precision agriculture uses innovative technologies and principles to identify and manage spatial and temporal variability in crop production. By focusing on variability in a specific site, such as a single field, precision agriculture promotes efficient use of fertilizers, pesticides, and other inputs. Efficient agricultural production systems increase farmers’ profitability and decrease the environmental impact of their operations. Therefore, continued advancement of precision agriculture fosters strong, healthy farming communities. Developing new techniques and technologies requires interdisciplinary efforts. Engineers design and construct the technology for measuring and delivering of site-specific activities. Natural scientists conduct field research to evaluate the efficacy of these developments and economists determine the financial impact. Industry representatives also play a critical role by developing and marketing developments. NCERA-180 provides a committee that seamlessly integrates these different groups into a single, cohesive unit.

Who cares and why?

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What has the project done so far?

NCERA-180 has brought together public and private sector research scientists and engineers to develop and test technologies and techniques for improving site-specific crop management for several major U.S. and international commodity crops, including corn, soybeans, sugar beets, cotton, citrus, tomatoes, rice, oil palm, and cabbage. NCERA-180 scientists have developed software, Management Zone Analyst (MZA), that uses quantitative, georeferenced field information to mathematically divide a field into natural clusters, or zones, and also helps determine the optimum number of management zones for each field. Project researchers have also tested several new sensors, including an on-the-go soil pH sensor, on-the-go soil nutrient sensors, crop remote sensing sensors, a soil compaction sensor, crop chemical flow control sensors, and GPS sensors. The group
What research is needed?

Scientists need to continue to evaluate how soil variation relate to plant nutrient needs. To do this, scientists need improved tools for analyzing and interpreting precision farming data and relating it to data about soil, weather, and other factors influencing crop systems. In addition, various remote sensing platforms need to be calibrated in order to determine plant nutrient status.

Want to know more?

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