



Comparison of Spatially and Conventionally Managed Farms - A Research, Education and Demonstration Project

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NDSU Extension and ND Farm Business Management personnel are cooperating with 10 North Dakota farmers to evaluate possible advantages of using geospatial technology in crop production. The primary goal of the Comparison of Spatially and Conventionally Managed Farms Program is to improve our understanding of the economic and environmental factors important to farmers who adopt geospatial technologies to produce agricultural crops, according to project coordinator John Nowatzki, extension geospatial specialist. This interdisciplinary research, extension and education project will compare crop production on 160 acres on each of ten farms using geospatial technologies with crop production on similar land on each of the farms. The program will compare the farms for three years. The geospatial technologies will include: 1) geospatial records of crop inputs, expenses, yields and returns; 2) remote sensing of crops using infrared aerial photography and Landsat satellite imagery; 3) global positioning system (GPS) crop yield monitoring; 4) variable rate crop inputs; and 5) real-time GPS/GIS with hand-held computers.

Five Dickinson area and five Carrington area farmers are cooperating in this three-year project. Farm Business Management instructors, Steve Metzger, Carrington, and Jerry Tuhy, Dickinson, are selecting the cooperating farmers, and will work with Dickinson area extension cropping systems specialist, Roger Ashley, and Carrington area extension cropping systems specialist Greg Endres, to assist the cooperating farmers with spatial management decisions.

The cooperating farmers will use geographic information systems (GIS) software supplied by Ag Leader, Inc. to keep track of crop inputs, remote sensing data, crop yield data and field management zones on their fields. The farmers will use hand-held computers with attached GPS unit to help scout the fields during the growing seasons. The farmers will use recommended variable rate input applications on the designated fields, either using their own variable rate application equipment or through variable rate applications available from commercial applicators. They will also harvest the designated fields with combines equipped with yield monitors.

Nowatzki will provide green and NDVI layers of Landsat imagery taken during the growing season of each geospatially managed field in the participants' farms for initial use in delineating management zones. During each growing season, the geospatial specialist will acquire 1-foot resolution infrared and multi-spectral aerial photography for each of the participating farmers' fields. The growers will be able to download copies of the aerial photography from a program Internet site on the same day it is acquired to use in crop and field evaluation.

The participating farmers will collect combine yield data with corresponding GPS location data for all participating fields. After each growing season, the geospatial specialists will assist the farmers to analyze the yield data and correlate it with the other digital layers available for each field.

The program consultation team members will meet periodically during the growing seasons to evaluate remotely sensed data and to assist the growers with management recommendations. The consultation team members will receive copies of the aerial photography and satellite imagery. The consultation team will also meet annually, between growing seasons, to evaluate progress for each participant and assist with management recommendations.

Participants will have opportunities for training on the geospatial management software, GPS application equipment, remote sensing technologies and potential economic and environmental impacts of spatial management.

Nowatzki will also assess each field annually for potential groundwater and surface water contamination using the NDSU groundwater and surface water groundwater pesticide assessment systems. The pesticide assessment will be used to compare the effects of spatial land management to conventional land management on water resources.

Program personnel will prepare annual reports comparing the production and economic factors between the spatially and conventionally managed fields.

For more information about the Spatially Managed Farms Program contact John Nowatzki by telephone at 701-231-8213 or email John.Nowatzki@ndsu.edu

More information about geospatial technology is available from the NDSU Agriculture and Biosystems Engineering Department Web site at <http://www.ageng.ndsu.nodak.edu>. Follow the links to Extension Programs and Geospatial Technology Education.