



Learning About Variable Rate Fertilizer Application

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Judging from the number of telephone calls and email requests I receive requesting information about how to make fertilizer prescription maps, it is likely an increasing number of farmers are varying the amount of fertilizer applied across fields this year in North Dakota. Farmers use the global positioning system (GPS) coupled with other technologies to refine their crop fertility practices. Instead of applying a uniform fertilizer rate throughout a field, with the use of GPS and variable rate application equipment, farmers are experimenting with spatial management practices, varying crop yield goals within fields. Given the historically high nitrogen fertilizer prices, these farmers are attempting to make more efficient use of the total amount of fertilizer applied to each field by dividing fields into management zones.

Farmers starting to use variable rate fertilizer application have several tasks to accomplish before they get to the field. Acquiring equipment capable of varying fertilizer inputs, although the most expensive step, is usually not the most difficult task. The most common questions I receive relating to this technology are how to make variable rate maps, how to get those maps in a format that the equipment controllers will accept, and how to work between brands of machinery equipment.

Making variable maps requires a geographic information systems (GIS) computer program and valid information to reliably divide fields into zones for variable rate application. GIS programs are used to combine information to develop management zones and variable rate application maps (often called prescription maps). Prescription maps are used in fertilizer application controllers, really computers, installed in the tractor cab. These onboard computer/controllers send both map and GPS information to the variable rate controller on the fertilizer application equipment to varying the amount of fertilizer applied at different locations across the field. This process requires a computer GIS program and the skills to use it. Some fertilizer supply companies sell this service on a per acre basis. There are several GIS computer programs available to make variable rate application maps including general GIS programs such as ArcView, MapInfo and Farm Works. Most of the major agricultural equipment companies sell GIS programs that are specifically written for farm applications. I recommend using one of the GIS programs specifically developed for farms.

I encourage individuals to take time to learn what kind of GIS programs are available, the costs involved, and the skill live required to use them. The NDSU extension service regularly schedules GIS workshops across North Dakota. Anyone interested in more information or training opportunities can contact their county extension office to ask them to assist in scheduling training in your areas. Other agencies also provide training in this technology. The Upper Midwest Aerospace Consortium (UMAC) at the University of North Dakota is providing training to farmers, ranchers, crop consultants and others who want to learn more about geospatial technology applications in agriculture. These one day training programs are repeated on March 24, 29, and 31. Their training includes presentations by farmers who are successfully using the technology, and a hands-on computer lab tutorial using imagery of participants' land where possible. A \$25 registration fee covers breakfast and lunch charges. The training sessions will be held from 8:30 a.m. to 5:00 p.m. in Streibel Hall, room 107, in the UND Aerospace complex at University Avenue and Campus Road in Grand Forks. For more information about the UND seminars or to register, contact UMAC Administrative Secretary Kathy Ebertowski at 701.777.2940, or email

kaeberto@aero.und.edu.

The companies and individuals selling variable rate application equipment are the best source for technical support for their brand of equipment. However, many farmers use more than one brand of equipment and find that moving maps and digital data from one brand to another often presents problems. Farmers need to ask these technical representatives what kind of map file formats each brand will accept. The most common map file type for exchanging maps between brands is a shapefile, although some equipment controllers will not accept this format either. The file extension for shapefiles is .shp. It is important to resolve the digital problems before using the equipment in the field.