

PLANT & PEST ADVISORY

FIELD CROPS/LIVESTOCK EDITION \$1.50

OCTOBER 2, 1997



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Will Precision Agriculture Work for Field Crops in New Jersey?

Brian S. Aldrich, Agricultural Outreach Consultant, North Jersey Resource Conservation and Development Council

Site-specific management”, “prescription farming”, “variable rate technology”, “precision agriculture” — these are some of the new buzz-words we’ve been hearing about. The trade journals regularly feature articles about the growing adoption of “precision agriculture” technologies in the Midwest. The Potash & Phosphate Institute now holds an annual Information Agriculture Conference.

All of these terms are a result of advances in using computers to improve crop production. The basic idea is this: a special receiver mounted on your tractor picks up signals from several satellites. The receiver is connected to a microcomputer, also in your tractor. The computer has a program called a “Global Positioning System” (GPS) which uses the satellite signals to pinpoint your position in the field. The computer then directs the spreader or sprayer to increase or decrease the amount of fertilizer or pesticide being applied, based on the position in the field, and on previously gathered information about soil fertility and pest populations. In this manner, inputs are used where they are most needed, and withheld where they are not needed.

GPS works well in the Midwest, where fields are flat and laid out in square sections. But will it work in New Jersey, where fields are often small, irregularly shaped, and lined by trees? Is it really worth the money? A complete system may cost as much as \$10,000. To answer these and other questions, I went to one of the annual Information Agriculture conferences. Here’s what I learned.

Question: Wouldn’t the intensive soil testing required to make a field fertility map be prohibitively expensive?

Answer: One Illinois fertilizer dealer was taking a soil sample from every 2.5 acres. They used a lab which charged \$5.40 for a standard soil test (pH, phosphorous and potassium). Thus the cost for lab fees was only \$2.16/ac., an affordable price.

Question: Who’s going to do the work of taking all those extra soil samples?

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Answer: Consulting firms are springing up to supply this need. On the flat Midwestern terrain, one sampler driving an all-terrain vehicle can sample 400 acres/day with a conventional punch tube. One firm's staff was doing 45,000 acres per season. Meanwhile, entrepreneurs are experimenting with mechanized samplers to speed up the process.

Question: Why would a fertilizer dealer be involved with this technology — isn't it going to mean reduced sales?

Answer: The Illinois fertilizer dealer I visited with had two comments. Their preliminary experience with variable rate fertilizer application did not result in less total fertilizer applied per field; rather, it resulted in a *redistribution* of nutrients. Rates were decreased on the high fertility areas, but increased on the low fertility spots, resulting in no net change compared to the standard practice of applying one rate to the whole field. The benefits were increased yield where soil fertility had been low, and decreased fertilizer expense where fertility was high.

The dealer also felt that even if precision agriculture reduced sales per farm over time, they would make it up by gaining more market share. Their goal is to offer the most cost-effective fertilizer application. They believe growers will stay with the dealer who provides the best service.

Question: Will hedgerows interfere with GPS receivers on small fields in New Jersey?

Answer: Improvements in GPS technology and resolution power are advancing at a rapid rate. The competition is keen. Resolution is already down to several yards or less. At the current rate of development, it seems likely that GPS receivers will be able to function in semi-forested as well as prairie-type areas.

Is precision agriculture for you? If you are already keeping written records about the inputs you apply on every field, that's a good start. If you have a computer, then the next step is using a software program to store your crop records. If you have never used a computer before, you should start with word processing (using the computer as a typewriter), so that you can learn how to use the keyboard. There are also financial programs which will record all of your expenses and income.

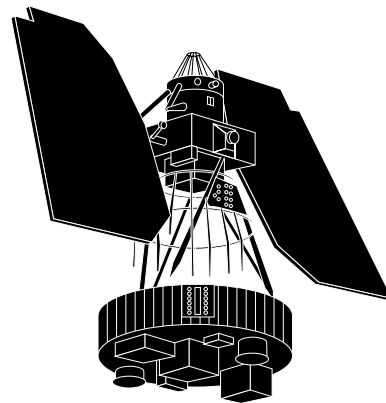
Once you are comfortable with a computer, a yield monitor is a good way to get started in precision agriculture. These devices have sensors which measure grain flow and moisture in the combine. Coupled with a GPS system, they can create yield maps of your fields. Yield maps are useful for identifying problem areas in the

field. Mapping the same field for several years will give you a good base of information. Then you can add other features, such as soil fertility and pest location maps, to try to learn why the yields in your fields vary the way they do.

Some analysts feel that precision agriculture is an expensive hobby for computer "geeks" who are happy playing with wires and hardware and software, just for the fun of it. The start-up costs are expensive, and the systems are still being debugged. Precision agriculture can produce a landslide of data which buries the grower, and is so overwhelming that the potentially useful information is hard to separate from the useless.

On the other hand, the ability to custom farm each acre cannot help but capture our imaginations. It takes time to learn to use GPS systems. The first growers to try it say it took at least five years of experience and collecting data before they were able to take full advantage of the system.

Based on the track record of microcomputers to date, it's reasonable to project that ten years from now we will be seeing new applications of computers to crop production which we can't even imagine today. Even if GPS as we know it now is not the ultimate stop, whoever gets on the learning curve now will be best positioned to compete in the future. □



Editor's Note: This is the last issue of the Field Crops/ Livestock edition of the Plant & Pest Advisory for the '97 season. Thank you for subscribing.

Tips on Using Moisture Meters

William J. Bamka, Burlington County Agricultural Agent

Many decisions regarding grain farming are made relative to the moisture content of the grain. Grain moisture content is critical in making management decisions regarding harvest, drying, storage and marketing. Therefore, the proper use of a moisture meter and sample collection is essential.

Improper moisture readings can result in several problems for growers. Examples of problems that may be encountered include:

- Excessive drying costs when grain is harvested too wet.
- Moisture discounts when grain is delivered too wet.
- Increased potential for combine loss and grain damage when grain is harvested too wet.
- Grain spoilage when grain is too wet for natural air drying.

The following are some tips to help you obtain accurate moisture readings.

Check batteries: One of the first things that should be done to make sure moisture meter readings are accurate is to check the battery in the meter. A low battery will cause the meter to give inaccurate readings. Consider replacing the battery yearly.

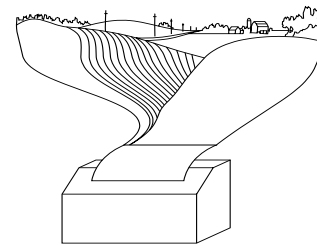
Calibration: The moisture testers at grain elevators are required to be inspected and calibrated for accuracy regularly. Take several readings on your farm moisture meter and compare them for accuracy against the grain elevator. This will allow you to calibrate your farm moisture meter. Consider having your moisture meter factory-serviced if there is a great deal of variation between your meter and the elevator's moisture tester.

Temperature Compensation: Grain temperature has a major influence on moisture readings. If your moisture meter does not have automatic compensation for grain temperature, follow the temperature compensation chart that comes with the moisture meter. Also follow the manufacturers recommendations for the optimum temperature ranges for testing grain.

Representative sampling: Obtaining a representative sample is also crucial to obtaining an accurate moisture reading. When sampling trailer loads of grain, probe the trailer in several locations. Collecting a grain sample from the top of the load is not a good way to obtain an accurate reading. Samples can also be collected from flowing grain during unloading.

When sampling grain from a bin, several samples should be obtained from various depths. This will aid in determining the progress of the drying front during drying. Routinely sampling grain in the bin during storage helps to avoid spoilage problems.

For further information regarding moisture testing, contact your County Agricultural Agent. □



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1997-98 New Jersey Farm Management Program

Frances E. Adelaja, Program Associate in Farm Management

Under the umbrella of the 1997-98 New Jersey Farm Management Program, we are offering 28 seminars throughout New Jersey from November 1997 to March 1998. The seminars listed below are on topics farmers say would be most useful for their business operations. Up-to-date information is provided via lectures and practical exercises at seminars. Hands-on computer instruction is provided at computer seminars. These seminars are open to the public.

Some highlights of the seminars include: computerized accounting systems, tax management, the Internet and World Wide Web, estate planning, business writing for farmers, writing a business plan, creating a home page, computer basics & buying a computer, investments, family business issues, greenhouse business for the future, and nursery business for the future.

We invite you to attend any seminar that may be of interest to you. For registration, please call Joan Sorensen at 732-932-0100. For all other information pertaining to these seminars, please call Fran Adelaja at 732-932-9171 ext. 31

1997-98 NJ Farm Management Program

Event Date: November 3, 1997
 Event Time: 9:00 A.M. to 4:00 P.M.
 Event Title: What Does A Cooperative Director Do?
 Event Location: Cumberland County Extension Office, Millville, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: November 5, 1997
 Event Time: 9:30 A.M. to 3:45 A.M.
 Event Title: Marketing: Attracting Customers and Dealing with Laws and Regulations
 Event Location: Quality Inn, Somerset, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: November 11-12, 1997
 Event Time: 9:00 a.m. to noon and 1:30 to 4:30 p.m. each day
 Event Title: Computerized Farm Business Recordkeeping Using Quicken & QuickPay
 Event Location: Gloucester County College, Sewell, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: November 20, 1997
 Event Time: 9:00 A.M. to 1:00 P.M.
 Event Title: Retirement and Estate Planning for Farmers

Event Location: Old York Country Club, Old York Rd., Columbus, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: December 1, 1997
 Event Time: 6:00 p.m. to 9:00 p.m.
 Event Title: Farm Income Tax Management
 Event Location: Cook Campus Center, Cook Campus, New Brunswick, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: December 9, 1997
 Event Time: 9:00 a.m. to 1:00 p.m.
 Event Title: What New Laws Will Affect Your Estate Planning?
 Event Location: Columbus Grange, Columbus, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: December 16, 1997
 Event Time: 9:30 a.m. to 12:30 p.m.
 Event Title: Positioning Your Nursery Business for the Future
 Event Location: Somerset County Extension Office, Bridgewater, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: January 9, 1998
 Event Time: 9:30 a.m. to 12:30 p.m.
 Event Title: Finding Agricultural Information on the Internet
 Event Location: Loree Building, Microcomputer Lab, Cook Campus, New Brunswick, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: January 9, 1998
 Event Time: 1:00 P.M. to 4:00 p.m.
 Event Title: How to Create a Business Presence on the World Wide Web
 Event Location: Loree Building, Microcomputer Lab, Cook Campus, New Brunswick, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: January 12, 1998
 Event Time: 9:15 a.m. to 12:15 p.m.
 Event Title: Business Writing Skills for Farmers
 Event Location: Labor Education Center, Cook Campus, New Brunswick, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: January 14, 1998
 Event Time: 9:00 a.m. to 5:00 p.m.
 Event Title: QuickBooks for Windows
 Event Location: Gloucester County College, Sewell, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: January 16, 1998
 Event Time: 9:30 a.m. to 12:30 p.m.
 Event Title: Computer Basics & How to Buy a Computer
 Event Location: Loree Building, Microcomputer Lab, Cook Campus, New Brunswick, NJ
 Contact: Joan Sorensen (732) 932-0100

Event Date: January 16, 1998
Event Time: 1:00 p.m. to 4:00 p.m.
Event Title: Creating a Home Page for Your Business
Event Location: Loree Building, Microcomputer Lab,
Cook Campus, New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: January 20, 1998
Event Time: 9:30 a.m. to 12:30 p.m.
Event Title: Positioning Your Greenhouse Business
for the Future
Event Location: Somerset County Extension Office,
Bridgewater, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: January 22, 1998
Event Time: 1:30 p.m. to 4:30 p.m.
Event Title: Farm Recordkeeping Options: Making
Them Work for You
Event Location: Trump Taj Mahal, Atlantic City, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: February 9, 1998
Event Time: 6:00 P.M. to 9:00 p.m.
Event Title: All in the Family: Business Issues for
Farm Families
Event Location: Labor Education Center, Cook Campus,
New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: February 11, 1998
Event Time: 10:00 a.m. to 3:00 p.m.
Event Title: Getting the Most from Your Employees
Event Location: Labor Education Center, Cook Campus,
New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: February 16, 1998
Event Time: :00 P.M. to 9:00 p.m.
Event Title: How to Invest in Mutual Funds for
Financial Independence
Event Location: Labor Education Center, Cook Campus,
New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: February 19, 1998
Event Time: 9:00 a.m. to 1:00 p.m.
Event Title: 1997 Tax Law Update for Estate,
Business, Retirement, and Family
Succession Planning
Event Location: Rutgers University Snyder Research
Farm, Pittstown, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: February 23, 1998
Event Time: 6:00 P.M. to 9:00 p.m.
Event Title: Investing for Income: How to Select
Fixed and Variable Income Securities
and Preserve Capital
Event Location: Labor Education Center, Cook Campus,
New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: February 24, 1998
Event Time: 7:00 P.M. -10:00 p.m.
Event Title: Dealing with State and Federal Labor
Regulations
Event Location: Gloucester County Extension Office,
Clayton, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: March 3, 1998
Event Time: 7:00 P.M. -10:00 p.m.
Event Title: Dealing with State and Federal Labor
Regulations
Event Location: Atlantic County Extension Office, Mays
Landing, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: March 10, 1998
Event Time: 7:00 P.M. -10:00 p.m.
Event Title: Dealing with State and Federal Labor
Regulations
Event Location: Cumberland County Extension Office,
Millville, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: March 18, 1998 Event
Time: 8:00 A.M.-11:00 a.m.
Event Title: Dealing with State and Federal Labor
Regulations
Event Location: Burlington County Extension Office, Mt.
Holly, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: To be determined
Event Time: To be determined
Event Title: Dealing with State and Federal Labor
Regulations
Event Location: Morris County, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: March 2, 1998
Event Time: 6:00 P.M. to 9:00 p.m.
Event Title: Developing a Business Plan for Your
Farm
Event Location: Cook Campus Center, Cook Campus,
New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

Event Date: March 9, 1998
Event Time: 6:00 P.M. to 9:00 P.M.
Event Title: Production Recordkeeping and Cost
Analysis
Event Location: Cook Campus Center, Cook Campus,
New Brunswick, NJ
Contact: Joan Sorensen (732) 932-0100

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