take the incentive and try no-till for five years.

David Hula, Charles City no-till farmer and early supporter of the ICS program, advises farmers new to no-till to follow a systems approach. "If you switch to no-till, you'll need more than just an adequate seeder," says Hula, who has raised no-till corn, soybeans, barley and wheat on the family-run Renwood Farms, Inc. since 1987. "You also must change your weed management strategy and plan to manage for different insects as well."

The incentive program helps farmers make the necessary changes, Hula says. "The money helps if a farmer needs to change equipment or change his herbicide program. Plus, the incentive will help offset any yield reduction."

The key to making no-till work is staying power. "At the end of the 5-year period, a grower won't go back to conventional tillage," Black says. "Once he's made that investment and seen the results, he's not going to want to work up the land again or go back to hiring men to help till it."

Moving ahead

Black and Noyes agree that they still have obstacles to overcome when asking producers to try no-till. Many farmers hesitate to adopt no-till because of perceived financial risk and resistance to change.

Black advises farmers to just try no-till. "It works. It's as simple as that."

"We are convinced that financial assistance is needed to allow farmers to retool and adopt the complexity of intensive management systems that address soil quality," says Noyes.

Noyes plans this year to continue research that will quantify the nutrient benefits of long-term no-till in these Virginia counties. The same data will validate ICS and its potential to increase soil quality and protect water quality.

The potential for ICS is not yet realized, says Noyes. "ICS represents a revolution in pollution reduction that can be applied across the Coastal Plain and Piedmont of the Chesapeake Bay watershed at a fraction of the projected cost of alternative options."

ICS partners are working on an informational video. For more information, contact Brian Noyes at (804) 932-4376 or David Black at (804) 829-2551.

Brad Ramsay contributed to this story.

Rainfall Simulator Proves No-till Benefits

In summer 2000, the ICS program contracted with Virginia Tech to finance Rainfall Simulator Research.

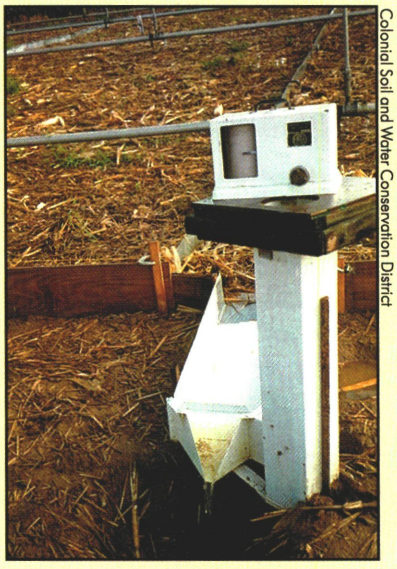
The simulator dropped water equivalent to a 5-year storm onto plots set at a 9 percent slope to compare tillage and fertilizer treatments.

One plot was plowed to simulate a clean-till seed bed for wheat. The other four treatment plots had 10 years of continuous no-till. Two no-till plots were given 3 tons of poultry litter. Two clean-till plots received equivalent amounts of commercial fertilizers. The same amount of commercial fertilizer was applied to two subsoil plowed plots and two no-till plots. Two control plots received no treatment.

Runoff collections from all plots were analyzed to compare conventional tillage and no-till.

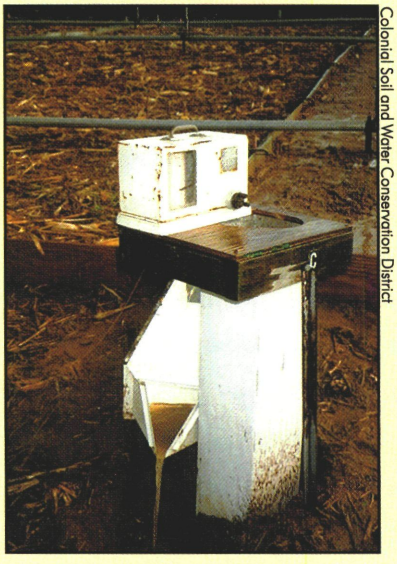
Results showed more than 1.5 **tons** of sediment loss to the acre on the plowed treatment. The 10-year no-till plots averaged only 18 **pounds** of sediment loss to the acre. One plot was as low as 5.4 pounds. Average nutrient losses on the no-till plots were reduced by 95 percent for nitrogen and 92 percent for phosphorus. Runoff volume was reduced by 75 percent.

The research was done by Dr. Blake Ross, Department of Crop & Soil Environmental Sciences at Virginia Tech. He can be reached at (540) 231-4702.



Colonial Soil and Water Conservation District

Runoff captured from the continuous no-till plot (above) was less in volume and contained less sediment and nutrients than the conventionally tilled plot (below).



Colonial Soil and Water Conservation District

More Than Just Another Plan

Core 4 Conservation combines production and stewardship

By Dan Towery

Are all conservation plans the same? Do farmers need more?

Conservation plans may look and sound the same on the surface, but they have different guidelines to achieve varying objectives. Some plans are written to meet program requirements, instead of producer needs, by merely listing practices to be installed for the next 5-10 years. Such a plan may list the crop rotation, type of tillage and expected residue level, estimated soil loss, pesticide and phosphorus risk potential, needed mechanical practices and amount of nutrients needed.

Not all growers will have a conservation plan, but most will have some type of a production plan. This plan lists everything a producer needs to meet production goals and is the basis for determining total input costs and profitability. Items listed include crop rotation, varieties, N, P, K, lime, micronutrients, herbicides, insecticides and more. It may not list any conservation practices nor address resource concerns.

Core 4 Conservation approaches conservation planning differently. The producer's needs guide the development of a Core 4 Conservation plan, which is a system of "key" practices (see *Partners* March/April 2001). This plan trims input costs and improves efficiency while maintaining or increasing yields. In this way, producers respond to economic advantages first and, as a result, consider resource protection as an added benefit. Combining profitability with conservation, therefore, appeals to a broader range of producers and leads to greater long-term resource protection. Core 4 Conservation plans focus on "key" practices applied as a system in order to achieve Better Soil, Cleaner Water and Greater Profits, which lead to a Brighter Future.

Better Soil

The right combination of inputs and management can yield better soil. Crop rotation, tillage systems and nutrient management that improve soil quality are important elements of a Core 4 Conservation plan. Going beyond simply reducing soil erosion, the system of practices should result in increased organic matter, improved infiltration and other enhanced soil properties. Reducing soil erosion to a tolerable soil loss level, or "T," is one standard, but if the technology exists to do more, it should be used.

Cleaner Water

Better soil is the first step to cleaner water. Soil can act as a filter and extract many potential pollutants from field runoff. A Core 4 Conservation system that includes buffer areas, in addition to conservation tillage, can provide a second line of defense when intense storm events occur. This plan also may account for leachable products such as nitrogen and highly soluble pesticides that need "special management" in areas where water quality is impaired.

Greater Profits

The right combination of practices will not only improve soil and protect water, but also increase profits for farm families. Conservation tillage requires fewer trips and saves time, fuel and equipment wear. Fine-tuning nutrient application maximizes nutrient efficiency and reduces nutrient costs. Pest management, or IPM, determines the optimal time and amount of pesticide application, often lowering input costs. Other tools, such as biotechnology, can minimize pesticide needs and reduce costs. Including marketing strategies, such as hedging and locking in future prices, in a Core 4 Conservation plan is another method for increasing profits. Some crops may be sold at a premium with a "green label." Value-added crops such as seed soybeans, high oil corn, specialty wheat and others, can earn extra dollars.

Brighter Future

The combination of Better Soil, Cleaner Water and Greater Profits leads to sustainable economics and environmental protection for agriculture. Not only is this good for the farm family, but it is also good for their community and our nation.

A Core 4 Conservation plan combines a conservation plan with a production plan. Key practices, applied as an integrated system, will meet the Core 4 Conservation objectives. This one plan considers both the farmer's bottom line and environmental needs by linking profitability with conservation. Better soil and cleaner water for society. Greater profits and a brighter future for farm families.

Dan Towery will answer your questions about Core 4 Conservation. Send your questions via e-mail to towery@ctic.purdue.edu or fax to (765) 494-5969.

Core 4 Conservation in Michigan

Watershed group adopts initiative to protect Muskegon River

By Gale Nobes

Michigan's Muskegon River is a treasured water resource in a state with tremendous water resources. It is unique in its diversity from its drowned river mouth and huge freshwater estuary marsh, to its large headwater lakes and extensive wetlands 220 miles up river from Lake Michigan. It has urban, rural and wild areas, scenic vistas, rare ecosystems, industry and agriculture. It is Michigan's second longest river and its watershed covers an area larger than the state of Delaware.

Donald Holzhausen

Gale Nobes, chair of the Muskegon River Watershed Assembly, works to protect the river by helping the watershed's ag producers implement Core 4 Conservation.

Michigan residents are blessed with water, and the residents and stakeholders of the Muskegon River watershed are no exception. They have recognized the value of clean water and sustainable resources. They have come together to assure that sustainability.

Partners Unite

The Muskegon River Watershed Assembly is a new grassroots organization whose purpose is to enhance and sustain the Muskegon River and its resources. The Assembly consists of stakeholders and partners from all areas of the watershed community and beyond. Our many concerned partners have been one of our greatest assets and most valuable resources. Many groups, individuals and organizations have joined in our efforts to sustain this outstanding resource. Among the first of our partners to offer assistance was the Conservation Technology Information Center (CTIC). The "Know Your Watershed" program provided the first national recognition of our fledgling "Assembly." Designation of the Muskegon River as a national priority demonstration watershed for the Core 4 Conservation initiative clearly demonstrates recognition that the Muskegon watershed is full of opportunities to share information regarding the Core 4 Conservation goals. CTIC's Core 4 Conservation initiative was a natural fit for the Muskegon River Watershed Assembly.

Common Goals

Core 4 Conservation is especially important in our watershed. Maintaining clean water that meets the designated uses of communities throughout the watershed and the Lake Michigan basin is a priority for all. This priority heightens in step with our constantly increasing water needs.

From the Assembly's viewpoint, Core 4 Conservation is a sensible approach to a very important aspect of watershed stewardship. Roughly one third of the watershed's land-use is agriculture. That's over 780 square miles. The agricultural community is obviously a valued component of our watershed. To sustain both natural resources and the farming community, the Core 4 Conservation goals of Better Soil, Cleaner Water, Greater Profits, and a Brighter Future are a logical management tool that creates a win-win situation for everyone. They minimize undesirable impacts while maximizing resources to sustain those values identified by the watershed stakeholders.

To date, the Muskegon River Watershed Assembly has hosted two Core 4 Conservation watershed events with the assistance of the CTIC. At least one more event will be hosted in 2001. These "events" include training and information sharing opportunities for our partners who work within the watershed assisting agricultural producers. We also have targeted producers who must apply the conservation practices that will attain the Core 4 Conservation goals. We will continue to promote these ideas because they make good sense and will help us meet the Assembly's mission. We believe these Core 4 Conservation events will provide long-term benefits for water quality and the quality of life for the watershed and its inhabitants.

For more information about the Core 4 Conservation efforts in the Muskegon River Watershed, call Gale Nobes at (231) 924-2230.

CTIC Goes to Washington

The Core 4 Conservation message has reached all the way to Capital Hill. On March 27, CTIC Chair Bruno Alesii and Executive Director John Hassell traveled to Washington, D.C., to meet with Senate and House ag staffers. The visitation list included staffers from the following offices:

Sen. Thomas Daschle (D-S.D.)
Sen. Richard Lugar (R-Ind.)
Sen. Mitch McConnell (R-Ken.)
Sen. Pat Roberts (R-Kan.)
Rep. Larry Combest (R-Texas)
Rep. Frank Lucas (R-Okla.)
Rep. Charles Stenholm (D-Texas)

The visits followed the March 1 testimony by Hassell before the U. S. Senate Committee on Agriculture, Nutrition and Forestry about the conservation portion of the Farm Bill. During the meetings, Alesii and Hassell discussed the background and mission of CTIC, shared information about Core 4 Conservation and gave recommendations for consideration during reauthorization discussion of the Farm Bill.

NACD

While in Washington, D.C., CTIC Executive Director John Hassell spoke with U.S. EPA Administrator Christie Whitman.

CTIC members can help spread the word about our partnership and Core 4 Conservation. Call (765) 494-9555 to find out how.

Product Feature

Strip-Till...
the Progressive and Profitable Way to Grow Corn

This 18-minute video focuses on the fundamentals of strip-till corn. Individual copies are $10 for shipping and handling. Significant discounts are available for multiple copies. (Note: video includes a brief Monsanto commercial.)

Call (765) 494-9555 for ordering information.

Nonpoint Source Pollution Monitoring Conference

August 27-30
Hyatt Regency
Indianapolis, Indiana

Conference

Land managers and water quality specialists will share information on the effectiveness of best management practices (BMP) in improving water quality, effective monitoring techniques, and statistical analysis of watershed data. The focus will be the successes of Section 319 National Monitoring Program projects and other innovative projects from throughout the United States.

Sessions will focus on these topics:

- Agricultural BMP implementation and water quality impacts
- Agricultural nonpoint source programs
- Volunteer monitoring in nonpoint source projects
- Innovative monitoring in agricultural landscape
- Animal operations and nutrient management programs
- Land use effects on fisheries

Workshops

TMDL Workshop (Tetra Tech, Inc.)
Monday, August 27, 9 a.m. – 1 p.m.

This half-day workshop on Putting Together a TMDL Implementation Plan will include discussions on the "how to" and lessons learned from several existing plans. Pollution source identification also will be included to assist watershed managers in their own situations.

Getting in Step: A Pathway to Successful Outreach and Stakeholder Involvement in Your Watershed
Monday, August 27, 9 a.m. - 1 p.m.

This workshop, sponsored in part by the U.S. Environmental Protection Agency, will review the basic building blocks to effective outreach and involvement with a special focus on tools and techniques.

For more information and to register contact CTIC at (765) 494-9555.

Colorado

Colorado's steering committee continues to promote Core 4 Conservation concepts to the Colorado agriculture public at local grower meetings, training sessions, Cooperative Extension programs, cooperative Conservation District/NRCS field days, USDA-ARS field days, the Yuma Irrigation Research Foundation Farm programs and field events.

The ongoing Tri-State Strip Till Demonstration project (See *Partners* March/April 2001) made progress this spring. In the last month, the Irrigation Research Foundation applied dry-spread fertilizer application. The Core 4 Conservation partnership looks forward to data collected during this five-year study.

Georgia

Interest in conservation tillage continues to grow in Georgia with more than 75 new members joining the Georgia Conservation Tillage Alliance (GCTA) recently. Additionally, another conservation tillage alliance, the Southeast Georgia Conservation Tillage Alliance (SEGCTA), was formed in February 2001, bringing the number of alliances in Georgia to five.

The SEGCTA is headquartered in Metter, Ga., and already has members from Candler and several surrounding counties. Jimmy Donaldson of Metter has been selected as President of SEGCTA. Contact Brad Phillips at (912) 685-2408 for more information.

The CSRA Conservation Tillage Demonstration Farm will hold its annual field day on July 19. The farm is located in Burke County, just south of Augusta. Contact Richard McDaniel at (706) 554-2119 for additional information.

Indiana

The Core 4 Conservation 319 Grant project is in phase I with phase II to begin in November. At this time, eight producer/landowners have signed or are about to sign applications requesting funding in the amount of $106,870 in the two targeted Indiana watersheds. The funds are being used to assist producers with improving practices on 2,246 acres of conservation tillage, 2,348 acres of nutrient management and 21 acres of buffers. Payments will be made for yield monitors and residue spreaders for combines, no-till planter modifications, chemical containment structures, spring development and waterways. These are just a few of the practices that will be or have already been installed. For more information, contact the Daviess County Soil and Water Conservation District office at (812) 254-4780 or Bruce Finkbiner, Core 4 Conservation Project Coordinator at (812) 382-4472.

Pacific Northwest

One objective of the Pacific Northwest Direct Seed Association is to seek out and establish value-added opportunities for direct seed farmers. During its first year, the Association developed relationships with *The Food Alliance (TFA)*, a Portland, Oregon-based nonprofit organization dedicated to promoting increased adoption of sustainable agriculture practices, and with *Salmon-Safe*, a cooperative agricultural program that rewards the farming community for instituting conservation practices that benefit water quality and native salmon populations.

Karl Kupers' farm near Harrington, Wash., was the first direct seed operation certified by *The Food Alliance*. The Food Alliance seal of approval certifies that a farming system has met standards in three areas: conserving soil and water, seeking alternatives to pesticides and caring for the well-being of farm workers and rural communities. Once certified, TFA supports members with a comprehensive marketing campaign and verifies continued commitment to its certification specifications annually.

Steve and Nate Riggers, near Craigmont, Idaho, were granted *Salmon-Safe* certification. Once earned, the *Salmon-Safe* label is intended to give farms a competitive advantage in the marketplace.

For more information log on to http://pnwsteep.wsu.edu.

Congratulations, Mike!

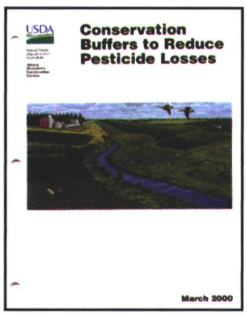
Mike Petersen, area soil scientist with NRCS in Colorado, led the efforts to bring Core 4 Conservation to his state. CTIC is proud to add our congratulations to USDA's recognition of his efforts.

The certificate presented to Mike earlier this year reads:

> For exceptional performance in development of training materials for technical soil services, initiation of Core 4 activities and accomplishments of all job duties in FY 2000.

Buffers Reduce Pesticide Losses

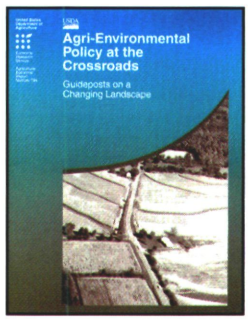
Conservation Buffers to Reduce Pesticide Losses, March 2000 Issue. This publication provides detailed information about what a conservation buffer is and how it reduces pesticide loss. It explains the different types of buffers and how they work. Results from one of the earliest studies on the effectiveness on grassy waterways are given.



In addition, advice on designing buffers for maximum efficiency is given. To inquire about this publication, contact Joe Bagdon at (413) 253-4376. Find it online at www.wcc.nrcs.usda.gov/factpub/factpub.html.

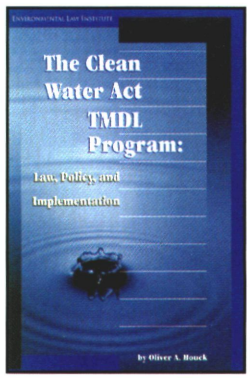
Policy Guidance for Ag and Environment

Agri-Environmental Policy at the Crossroads: Guideposts on a Changing Landscape (AER-794) is available from the USDA's Economic Research Service. This report provides policymakers with a guide to some of the choices they may face with respect to natural resource and environmental issues. Electronic copies of this report can be obtained on the Economic Research Service's Web site at www.ers.usda.gov. Printed copies are available from the USDA order desk. Call (800)-999-6779 and use order number ERS-AER-794.



TMDL Handbook

Tulane Law Professor Oliver A. Houck, one of the country's leading experts in water quality law, has written The *Clean Water Act TMDL Program: Law, Policy, and Implementation*. This guide offers step-by-step guidance to understanding TMDLs. To order, call (800) 433-5120 or (202) 939-3844 or fax (202) 939-3817. Save 10 percent when you place your order online at www.eli.org.



Web Resources

www.ctic.purdue.edu provides links to two new USGS reports that document water quality improvement attributable to the adoption of conservation tillage. Located in the New section, the reports are titled "Status and Trends in Suspended-Sediment Discharges, Soil Erosion, and Conservation Tillage in the Maumee River Basin - Ohio, Michigan, and Indiana" and "Water Quality in the Lake Erie - Lake Saint Clair Drainages - Michigan, Ohio, Indiana, New York, and Pennsylvania, 1996 - 1998. "

www.epa.gov/owow/tmdl offers a wealth of information including information on your state TMDL program, an overview of the current TMDL program and regulations and a National Overview of impaired waters. Check out the "What's New" link. There are several papers to read, including the Roger Kuhnle and Andrew Simon study on Sediment TMDLs.

webserver.cr.usgs.gov/sediment is a U.S. Geological Survey site that shows a survey of the SUSPENDED-SEDIMENT DATABASE and the Daily Values of Suspended Sediment and Ancillary Data. Information available at this site includes a summary of sediment patterns in the country, a description of the database and sediment stations in the U.S.

www.co2e.com is a "virtual marketplace" for carbon credits trading. CO2e.com was formed to prepare corporations globally to understand and manage the impact of a greenhouse gas constrained future. The site offers information about trading, CO2 strategies (a step-by-step guide to developing and implementing a carbon management strategy) and it will soon offer a range of business tools to assist in the quantification of CO2e.com emission liabilities and assets.

www.uswaternews.com is a weekly online publication that announces publications, policies, and activities of the US EPA's Office of Water. As the electronic version of America's water news publication *U.S. Water News Online*, the site keeps its visitors abreast of the latest news concerning water and water issues. Coverage includes water supply, water quality, policy and legislation, litigation and water rights, conservation, climate, international water news and more.

www.epa.gov/owow/nps/partnership offers information about the partnership recently formed by the EPA and states. They have joined together to identify, prioritize and solve non-point source problems. There are seven workgroups focusing on specific non-point source issues.

www.epa.gov/ow/funding.html provides information on funding sources for watershed protection, drinking water treatment and wastewater management projects. It is the official EPA's Funding and Grant website.

Watershed Assistance Grants

In April 2001, the U.S. Environmental Protection Agency's Office of Wetlands, Oceans and Watersheds selected River Network to coordinate and administer the Watershed Assistance Grants Program (WAG). The purpose of the WAG Program is to provide small grants to local watershed partnerships to support their organizational development and long-term effectiveness. While there will likely be a few changes from the application process used in 2000, River Network and EPA expect that the forthcoming 2001 application process will be similar to the one in 2000.

Information on the 2001 application process, including eligibility and selection criteria, is available on the web at www.rivernetwork.org.

The website's self-screening process will assure that you are eligible to receive a grant and that the activities you propose meet the criteria.

Corn Growers Support Effort to Reduce Nitrogen Runoff

The American Corn Growers Association (ACGA) has endorsed legislation recently introduced by Senator Christopher "Kit" Bond, R-Mo., and John Tanner, D-Tenn. The Fishable Waters Act (S 678 and HR 325) will provide $350 million per year for clean water projects geared towards reducing the amount of nitrogen and chemicals that run off into rivers, lakes and streams.

"It is clear that the problem of hypoxia and high nitrate levels is due, in part, to nitrogen fertilizer use. The Bond-Tanner legislation will enable farmers to use voluntary measures to rectify a problem agricultural producers have partially contributed to," said Larry Mitchell, chief executive officer of the ACGA.

The ACGA's Agricultural Water Quality Restoration Program (AWQRP) is based on the efforts to recognize and address the "Dead Zone" problem in the Gulf of Mexico. Under the AWQRP, farmers will be encouraged to utilize soil testing as a means to reduce nitrate levels. According to university studies, 20 percent of all nitrate levels could be reduced with widespread soil testing.

Therefore, financial incentives such as governmental cost sharing or tax incentives should be included in this legislation. The ACGA says it will work with Senator Bond and Congressman Tanner to include our AWQRP into their current legislation.

Computer Program Helps with Pest Management

A computer program developed by the University of Kentucky College of Agriculture's weed scientists is another aid farmers have in deciding how to control weeds in their crops.

WeedMAK II (Weed Management Applications for Kentucky crops) is an updated and expanded version of the original WeedMAK program that had been available during the past several years, said J.D. Green, University of Kentucky Extension weed science specialist. The program provides farmers with a list of chemical treatment options based on the effectiveness for specific weeds along with the estimated cost per acre for treatment.

An environmental component provides information about the herbicide leaching and runoff potential for a given treatment.

To use the program, crop producers need to know their weed problems, soil characteristics in each field such as soil type, pH, organic matter, and soil texture, crop information, general type of corn hybrid or soybean variety planted, and stage of crop growth. The previous crop, tillage system and weed size also can be added to provide site-specific information.

The program can be general or as detailed as a farmer chooses. The more site-specific input information provided by the user, the more specific the data.

Individual producers and ag businesses can obtain a copy by contacting Green at (859) 257-4898 or jgreen@ca.uky.edu.

New York Sea Grant Publishes First Agritourism Study Results

Results of the first study to quantify the impact of agritourism on New York State's economy have been published by New York Sea Grant in Oswego, N.Y. Agritourism businesses, farm-based businesses that are open to visitors, are a growing sector of New York State's tourism industry. Businesses such as farm stands, petting zoos with farm animals and wineries are types of agritourism businesses.

An eight-page fact sheet identifies the types of agritourism businesses and estimated income, expenses and profit by business type in each of the state's 11 designated tourism regions. The fact sheet looks at the mix of components businesses use and includes a table listing the top ten concerns of agritourism business owners.

A printed copy of the Agritourism in New York Fact Sheet is available for free online at www.cce.cornell.edu/seagrant/tourism/agritou.htm. For more information, contact Diane Kuehn, Coastal Tourism Specialist with NY Sea Grant at (315) 312-3042.

Building Bridges of Understanding Symposium Nov. 19, 2001

Hosted by Food, Land & People at the Presidio National Park, San Francisco, Calif., this event features candid discussions with agricultural, educational and environmental leaders from across the nation. The Symposium is also a learning opportunity for high school and college students.

For more information go to www.foodlandpeople.org or call (425) 562-4445.

CTIC Board of Directors

Calendar

May
May 21 - 23 **Composting ,** St. Paul, Minn. Contact: BioCycle, 419 State Ave., Emmaus, Penn., 18049; Tel: (610) 967-4135; Web: www.biocycle.net.

June
June 3 - 5 **Making Locally Led Conservation Work!,** Nebraska City, Neb. Contact: The National Arbor Day Foundation, P.O. Box 81415, Lincoln, Neb., 68501; Tel: (888) 448-7337; Fax: (402) 474-0820; Web:_www.arborday.org/locallyled.

June 3 - 8 **New Trends in Floodplain Management,** Charlotte, N.C. Tel: (608) 274-0123; E-Mail: asfpm@floods.org.

June 30 **AWRA/UCOWR "Decision Support Systems for Water Resources Management,"** Snowbird, Utah. Contact: Michael J. Kowalski, American Water Resources Association, 4 West Federal Street, Middleburg, Va., 20118; Tel: (540) 687-8390; Fax: (540) 687-8395; E-Mail: mike@awra.org.

August
Aug. 1 - 4 **Third Annual Agricultural Publications Summit,** Grand Rapids, Mich. Contact: Ag Publications Summit, P.O. Box 156, New Prague, Minn., 56071; Tel: (952) 758-6502; Fax: (952) 758-5813; E-Mail: ageditors@aol.com.

Aug. 5 - 6 **Wetlands and Remediation: The Second International Conference,** Burlington, Vt. Contact: Carol Young, Battelle Memorial Institute; Tel: (614) 424-7604; E-Mail: youngc@battelle.org; Web: www.battelle.org/environment/er/wetlandsconf/wetlandsconf.html.

For more upcoming events and to add your alliance events to the calendar, go to www.ctic.purdue.edu and click on Ag Calendar or Watershed Calendar.

Core4 Conservation
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INSIDE

NO-TILL-AGE®

Planting Intentions For No-Tilled Biotech Corn And Soybeans

% Of No-Tilled Crop	% Farmers No-Tilling In 2000	% Farmers No-Tilling In 2001
Herbicide Resistant Corn...		
1% to 9% of crop	18%	--
10% to 19%	27%	--
20% to 29%	19%	38%
30% to 39%	--	8%
40% to 49%	--	8%
50% to 59%	9%	22%
70% to 79%	9%	8%
90% to 99%	9%	--
100%	9%	16%
Herbicide Resistant Soybeans...		
1% to 9%	2%	2%
10% to 19%	10%	2%
20% to 29%	4%	9%
40% to 49%	5%	2%
50% to 59%	8%	9%
60% to 69%	7%	2%
70% to 79%	5%	2%
80% to 89%	7%	9%
90% to 99%	5%	2%
100%	47%	61%
Insect Resistant Corn...		
1% to 9% of crop	4%	5%
10% to 19%	7%	5%
20% to 29%	28%	22%
30% to 39%	12%	10%
40% to 49%	17%	14%
50% to 59%	17%	13%
60% to 69%	4%	5%
70% to 79%	4%	13%
80% to 89%	7%	8%
90% to 99%	--	--
100%	--	5%
Insect Resistant Soybeans...		
10% to 19%	50%	--
20% to 29%	--	50%
90% to 99%	50%	--
100%	--	50%
Both Herbicide and Insect Resistant Corn...		
20% to 29%	67%	67%
80% to 89%	33%	33%
Both Herbicide and Insect Resistant Soybeans...		
10% to 19%	50%	--
50% to 60%	50%	50%
100%	--	50%

–Survey of Attendees at 2001 National No-Tillage Conference

Frank Comments

By Frank Lessiter, Editor/Publisher

No-Till Could Save $458 Million

WITH INTEREST GROWING in having the government clean up the environment through carbon sequestration and other means, it's a good time to look at a successful 6-year continuous no-till program that's working well in Virginia.

Operated by the Colonial Soil & Water Conservation District in Quinton, Va., the program offers farmers a total of $65 per acre over 5 years for intensive cropping rotations that are never tilled. Funding comes from the Commonwealth of Virginia incentive funds to implement continuous no-till and nutrient management technologies to reduce non-point source pollution in rivers, lakes and streams.

Room For No-Till Expansion. Five years ago, about 5 percent of the farmland within the district was in continuous no-till. That figure jumped to nearly 75 percent of cropped acres in 2001.

A minimum of 90 percent biomass cover must be maintained for 5 years on a minimum of 90 percent of the enrolled acres. There is a cap of $20,000 per individual or corporation.

"The data shows this practice stands alone in non-point source pollution reduction cost effectiveness," says Bryan Noyes, conservation specialist for the district. "Many other advantages are associated with this practice, including ground water recharge, optimum stream flow, protection of continuous wildlife habitat, flood control and agricultural sustainability.

"We're convinced that the dynamics of soil quality will provide unprecedented benefits far beyond our current comprehension."

Rainfall Simulation Shows No-Till Benefits. The district last summer analyzed sediment runoff with a rainfall simulator. There was a loss of 1 1/2 tons per acre of sediment where small grains were seeded in plowed ground. No-tilling small grains resulted in only 5.4 pounds per acre of lost sediment.

Noyes says the program's primary obstacle has been a lack of state funds for implementation and research. He sees an opportunity to transfer the technology and pilot programs on carbon sequestration and nutrient trading if awareness of the intensive cropping system can be increased.

If the district can get new state cost share funding in the future, the payments to no-till farmers will increase over 5 years to $100 per acre.

Noyes says alternatives to no-till such as critical area planting and stream bank restoration don't address all the problems and also cost more. The intensive cropping system program effectively regulates storm and flood waters, allows long-term control with regulated release of nutrients and enhances wildlife habitat.

"Any grower that switches over is going to see an improvement, but the cost is the big stumbling block as the equipment is not cheap," he says David Black, a no-tiller from Charles City, Va. After purchasing a $32,000 no-till drill, he paid for it in 3 years.

Big, Big Payoff. Noyes says the Environmental Protection Agency says it will cost $464 million to reach the sediment reduction goals for the James River. "With the increased use of no-till, we believe that we can reach that goal with just an expenditure of $6 million," he says. That's a savings of $458 million in favor of no-tilling just in this small area of the country.

ADULT OUTREACH

Ag Expo 2000

Twelve hundred individuals attended the event, held at Renwood Farms in Charles City County. Colonial SWCD sponsored three research/demonstration sites. Dr. Blake Ross collected research to quantify reductions in erosion and nutrient run-off associated with continuous no-till. A fertigation pump demonstrated the process of injecting fertilizer into irrigation lines. Organic amendments such as biosolids and chicken litter on croplands were also demonstrated as possible uses for waste products and alternatives to commercial fertilizers.

Innovative Cropping Systems Forum

Experts in the fields of agriculture and conservation visited Charles City Virginia May 16 and 17 to discuss carbon sequestration, soil quality, productivity, air quality, and water quality. Professionals from Nebraska, Colorado, Indiana, and Maryland joined Virginia specialists to investigate how a small group of local farmers have revolutionized agricultural production in this area. Participant John Kimble, USDA/NRCS Soil Scientist in Lincoln, Nebraska, expressed that ICS is an "innovative program" of farm management "tied to off-site benefits such as improved water quality." Ron Follet, USDA/ARS Soil Plant Nutrient Research Leader from Fort Collins, Colorado, added, "agriculture is the solution to a lot of environmental problems" and feels ICS has a major role in that solution.

Agricultural Conferences

Colonial SWCD staff maintained a strong advisory presence at area meetings of the agricultural community by presenting data and experience associated with improvements in soil and water quality:

- Corn and Soybean Conference
- Four Rivers Ag Conference
- Virginia Crop Improvement Association Annual Conference

Watershed Planning

District staff serve on many committees to promote regional methods for improving water quality across the state.

- Hampton Roads Planning District Commission- Tributary Strategies Steering Committee
- James Watershed Conference
- Lower James Watershed Roundtable
- York Watershed Council and Quarterly Forums

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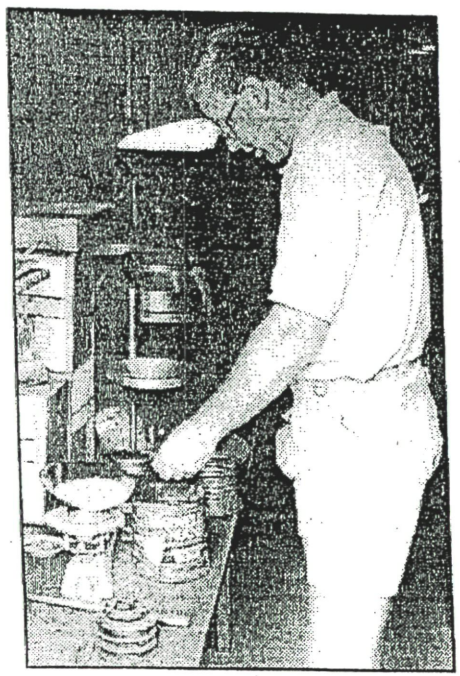
The Agribusiness Newspaper Serving Virginia

Established 1976 — www.americanfarm.com — January 2, 2001

Easton, Md., Volume 25, No. 41— Section 1 of 3— PERIODICALS MAIL (USPS 587-270)

Charles City's Hula wins NCGA!

Continued on Page 14



David Hula was busy this past fall processing corn samples at Renwood Farms, Charles City, Va. His 308.585 bushels was tops in the National Corn Growers Association annual competition.

By MARK POWELL

If you haven't yet, you might want to check out the results of the National Corn Growers Association's annual yield contest.

In the Class A (those areas outside of the Corn Belt) no-till, non-irrigated class, three farmers from the Mid-Atlantic region dominated. David Hula of Charles City, Va., was first with 308.585 bushels from his Pioneer 33Y11; Jay Justice of Beckley, W.Va., was second with his entry of 272.412 bushels grown from Pioneer 3245 across the border in Virginia. And, in third place, was Queenstown, Md., farmer Tim Bishop, whose entry was 254.407 bushels per acre grown with Campell Seed 695BT.

The national winner, again, for all categories was Iowa's Francis Childs who grew 357.3 bushels. That's actually down significantly from Childs' entry last year of 393.7 bushels. Childs blamed damage from a hail storm for the decrease in yield.

Back in the autumn, Hula knew he was looking at one tremendous crop of corn. He said he had a "nearly perfect growing season with plenty of rain, not too much heat and just enough stress in May to send the roots deeper in search of moisture."

Hula won the same category in 1999 with a yield of 257.19 bushels per acres. In 1996 and '97, he placed second in the national contest and slipped to third in 1998, a drought-plagued year.

Hula credits his use of Pioneer seed, precision ag techniques, outstanding river bottomland and lots of help from the other farmers in his family for his success in the yield competition. Hula is the fourth generation of his family to farm the land his great-grandfather purchased in

Continued on Page 12

The Virginia-North Carolina Shepherd's Symposium will be in Harrisonburg, Jan. 5-6. It includes a bred ewe sale.

INSIDE

FARM CHRONICLE of Virginia/Maryland June 12, 2000

Innovative Cropping Systems Prove Advantageous for Farmers

by Joi Dyer

On May 11, 2000, an Innovative Cropping System Field Day was held at the Good Luck Tract Farms in Charles City County, Virginia. Virginia's State Secretary of Natural Resources, The Honorable John Paul Woodley, Jr. and many others turned out to see how continuous No-Till and Innovative Cropping Systems (ICS) management practices can result in a model for pollution reduction and sustainability.

Innovative Cropping Systems (ICS) is promoted primarily through the Colonial Soil and Water Conservation District (CSWCD) and the cooperation of many other local resource partners. The ICS Project provides many incentives in the form of technical information transfer and financial assistance to promote agronomic systems that include continuous No-Till and intensive Nutrient Management. These two systems represent the most progressive (Limit of Technology) management for double crop cash grain and/or cotton rotations. As the benefits to soil quality and the efficiency of these systems, farmers would be able to compete in the global commodity grain and cotton markets.

Once adopted, ICS Technology has the ability to reduce 2.0 million tons of sediment and nutrient loading per year into the local tributaries and the Chesapeake Bay. Other reductions of toxins and storm water runoff are also associated with ICS. Adoption advantages include farm efficiency, such as competition in global markets, long term yield consistency and increase, saved time and fuel, better predictability of the nutrient movement, and most of all improved water and soil quality. Some disadvantages include scab and other diseases in wheat, weed and insect control, equipment costs, initial yield reductions and intensive management.

Good Luck Tract and David Black are regarded as some of the most progressive farmers in the state of Virginia. Showing repeatedly that he can accomplish what others say is not possible, the Blacks' have been pioneers in the development of intensive nutrient management of small grains, and have shown that efficiency pays. An intensive Biomass/Continuous No-Till Cropping Rotation has been incorporated into the farming practices and has also proven successful. Land applied/recycled Bio-Solid waste combined with a continuous No-Till rotation of grain sorghum, small grain, and soybeans has transformed steep, erosive, marginal-producing soils into a

(cont. on next pg.)

The honorable John Paul Woodley, Jr., Virginia's State Secretary of Natural Resources, listens closely as several farmers give their testimonials about continuous No-Till practices and advantages. Mr. Paul Davis of New Kent Cooperative Extension and many others turned out for the event.

(cont. from prev. pg.)

model of sustainability on the farm. David Black attests that the morphology of the soils sustain and build the organic matter, water no longer stands in the fields, the ability for the crop to withstand drought, field accessibility and increased yields are just some of the agronomic advantages to the ICS Technology.

Mr. Paul Davis, New Kent Cooperative Extension Agent, ensures that there is less labor with the new forms of technology. Twice as much land is worked in the same amount of time. The farmer can go through the fields and spray the field and then plant it. There is no tilling of the soil and excess time to prepare the fields for planting season. "The continuous no-till practices are both time saving and cost efficient. Fuel costs, down time, and repair are kept to a minimum," states Davis, "However, the farmers will need the assistance."

As both David Black and David Hula, pioneers of the long term continuous no-tillage practices, attest to the fact that the startup equipment is too costly for the Virginia farmers and with the decreased yield numbers in the first couple of years, most farmers would need some financial assistance. On the other hand, neither of the two farmers would ever give up the practices that they have practiced for over ten years.

With the incentives and advantages to the Innovative Cropping Systems Technology, many farmers are trying to make the switch to Continuous No-Till Practices. With the improved water and soil quality many farmers cannot dispute the unlimited amount of advantages that this new technology holds. As the honorable John Paul Woodley, Jr. stated, " the practices that the farmers are utilizing are very good, and I am very glad to be a part of it all." The field day that was held o the 11th of May on Goo Luck Tract in Charle City, Virginia proved tha the Innovative Croppin Systems Technology is successful, practical wa to go.

...ty ...es, NK farmers

By ALAN CHAMBERLAIN
Chronicle Editor

Farmers in Charles City and New Kent counties are helping to pioneer a planting technique that not only increases profitability in the long run, but is also good for the environment.

Continuous no-till, as the practice is termed, has been employed for several decades, but by only a handful of farmers. For a variety of reasons-- notably start-up expense and decreased harvest yields the first few years-- farmers have been reluctant to endorse the method.

More, however, are becoming converts, especially in the Colonial Soil and Water Conservation District of which Charles City and New Kent are a part.

District officials, with the aid of local Extension agents, demonstrated the benefits of no-till on May 11 to about two dozen local farmers and John Paul Woodley Jr., the state's Secretary of Natural Resources. The group toured a section of David Black's Charles City farm where no-till has been in continuous use since the early 1980s.

"Evidence shows the no-till method is providing the foundation for better soil quality," said Brian Noyes, a conservation specialist and coordinator for the Colonial SWCD.

"The method also prevents soil erosion and conserves nutrients, all of which will help farmers become more competitive in the world grain markets," he said.

No-till means exactly what the term implies - there is no tilling or deep-plowing of the soil. Instead, at least 60 percent of a cover crop, such as the remnants of wheat, sorghum, or soybeans, is left on the surface and is not plowed under as has been done under age-old farming practices.

Vegetation from cover crop allowed to decay, creating a natural fertilizer. The plant remnants also contribute to holding the soil in place, thus preventing erosion caused by rainfall runoff and wind.

The erosion-curbing benefits of no-till are catching the attention of state and federal officials who are seeking to reduce sediment contamination in the James River. All of Charles City and most of New Kent lies in the river's drainage basin.

"The Environmental Protection Agency says it will cost $464 million to reach the sediment reduction goals for the James," Noyes said.

"But we believe that with increased use of no-till, we can reach that goal with just $6 million," he added.

To entice farmers to make the switch to no-till, Colonial SWCD is offering incentives through state grant money in what is dubbed an Innovative Cropping Systems project. Farmers must apply for the grants, Noyes said, adding that, so far, the response has been overwhelming.

"Right now, we have more applications than we have money for," he said.

But the problem is a pleasant one considering the positive response to no-till. Black and other farmers are convinced the method's benefits far outweigh problems associated with converting to the practice.

Black told those on the tour that his family farm began utilizing no-till in 1971, applying the method to a soybean field at first and gradually expanding over the years to include more acreage.

"We're totally sold on it," he told the group. "Any grower who switches over to this is going to see an improvement.

"But cost is the big stumbling block," he added. "The problem is equipment is not cheap."

Heading the equipment list is a machine that plants seed under the no-till method. A no-till drill, as the device is called, ranges from $30,000 to $100,000 depending on the machine's width. The lower priced models enable farmers to plant seed in a path 10-15 feet wide. Top of the line machines can cover swaths of ground 30 feet in width.

Unlike conventional planting methods on bare, deep-plowed ground, rows of inch-deep furrows are dug by a no-till drill, working through the remnants of the cover crop on the surface. Seed is deposited in the shallow rows and covered with soil.

Farmers can then use sprayers, a device most already have, to apply fertilizer and pesticide, if necessary. Tillers, which are common among farm machinery, are no longer needed.

Noyes said purchase of a no-till drill constitutes a major investment for most farmers.

"But if we provide a little bit of help through the ICS program to get them over the hump, it's worth it," he said.

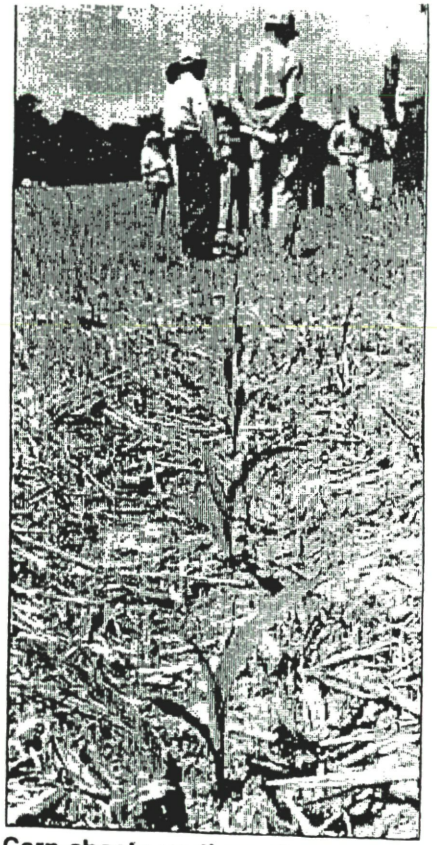
Farmers can then benefit from time savings, said New Kent Extension agent Paul Davis. Thanks to the width of a no-till drill, farmers can work twice as much land in the same amount of time, he added.

"The time savings means less labor and employees. And since there's no tilling, less equipment is needed so there's less fuel used and lower repair bills," he said.

"New technology makes it easier to do no-till," he went on. "Several years ago, we saw disadvantages, but with the new technology, it's hard to see any."

Disadvantages do exist, however, and are

Please see FARMERS, page 5



Corn shoots up through remnants of wheat, sorghum, and soybeans left as part of the continuous no-till practice. *Alan Chamberlain photo*

Farmers

Continued from page 4

encountered primarily when a farmer abandons conventional farming for no-till.

Davis said there looms the possibility of crop diseases and some perennial weeds that grow back from roots and seeds.

"It takes four to five years to get everything in synch," he said, pointing to a balance of microorganism and earthworm activity in the soil.

Rotating crops helps curb the weed problem, he said.

Ray Davis, a New Kent farmer who recently embraced no-till, said he encountered disease and lower crop yields early on.

"But we're seeing an increase in organic matter, and soils are holding better. And the large number of earthworms convince people that no-till is good," he said.

Eric Randolph, another New Kent farmer, said his father became one of the first farmers in the state to employ no-till, beginning in the early 1960s.

"We've come a long way from bottom plowing in a short time," he said. "Anybody who's in this business and is going to be in it for a long time has to move in this direction."

The Colonial district, which also includes ...k and James City counties and the city of ...iamsburg, has close to 40,000 acres of farm...nd, but less than 10 percent falls under no-till, Noyes said.

About one-third of the available farmland in both New Kent and Charles City is in no-till, according to Davis and Charles City Extension agent Vernon Heath.

"We're showing today that we're much more progressive than other districts in the state," Noyes said. "We estimate there's about 1.5 million acres in the state that could use this technique."

Woodley told the farmers, "[No-till] is 100 percent in line with where we need to be in terms of water quality in Virginia, particularly in the James."

Pointing to the rolling farmland, he said, "Here we are standing in a draw, and I'm astonished that there's no gully here. The soil stays in place. That's what we have to have happen in the state."

Noyes said that after hurricanes Dennis and Floyd combined to dump up to 30 inches of rain on the area last September, land under no-till management suffered no erosion.

"There was no evidence of concentrated runoff," he said. "Continuous no-till is showing changes in soil quality, and we believe this is what's controlling all this runoff.

"We can't evaluate all the different variables, but when we put all of this together, we have evidence that no-till works."

JAMES RIVER ASSOCIATION • P.O. BOX 110 • RICHMOND, VIRGINIA 23218-0110

TIDINGS

We are dedicated to the conservation and responsible stewardship of the natural and historic resources of the James River Watershed.

ol. XX No. 3 SUMMER 2000

3enefits of no-till farming explained in field demonstration

About 30 people gathered in David lack's soybean field in Charles City ounty May 11 to learn how Black and ther farmers have successfully imple- ıented no-till farming techniques.

In no-till farming, crops are rotated and ıe new seeds are planted in the stubble f last season's crop.

Black and farmers David Hula, Ray)avis and Eric Randolph described how ıe method has reduced the runoff of nutrients, leaving the organic content of their fields much higher than normal. The result has been higher crop yields and lower operating costs due to reduced need for fertilizers.

The farmers, who started this experimental method on their own, said the results have been much better than they expected.

The technique has also benefitted the environment by reducing nutrient and sediment runoff from fields into nearby streams and rivers.

The state is now trying to encourage no-till farming through a cost-sharing program. The state will pay up to 75 percent of the cost of implementing no-till and nutrient management technologies over a five-year period.

The meeting at Black's farm was part of a field observation organized by the Colonial Soil and Water Conservation District. Present at the demonstration were John Paul Woodley, secretary of natural resources; David Brickley, director of the Dept. of Conservation and Recreation, and Michael Clower, director of the Chesapeake Bay Local Assistance Dept.

The Colonial Soil and Water Conservation District says that "soil quality is the most cost-effective approach to reducing pollution loading to local water sources, because it controls the distribution of runoff at the site of raindrop impact."

The state estimates that no-till farming can reduce sediment runoff into the James River by one ton per acre per year.

No-till farming also helps control storm water, recharges ground water, traps nutrients and toxics, holds carbon in the soil, and enhances wildlife habitat.

)nservation specialist Brian Noyes, right, displays soil sample from David Black's farm.

VIRGINIA SOIL & WATER
CONSERVATION

Colonial Soil and Water Conservation District
P.O. Box 190 • 2502 New Kent Highway • Quinton, Virginia 23141-0190
Email: colonial-swcd@va.nacdnet.org • Web: colonialswcd.vaswcd.org
(804) 932-4376 • Fax: (804) 932-3438

Hard hitters in the Agricultural and Environmental Worlds Meet in Charles City

Major players in the agriculture and conservation arenas visited Charles City Virginia May 16 and 17 to discuss carbon sequestration, soil quality, productivity, air quality, and water quality. Experts from Nebraska, Colorado, Indiana, and Maryland joined Virginia specialists to investigate how a small group of local farmers have revolutionized agricultural production in this area.

The Innovative Cropping Systems project (ICS), a cooperative partnership between New Kent and Charles City farmers, local Cooperative Extension agents, and Colonial Soil and Water Conservation District was the hot topic of the event. Colonial SWCD staff Brian Noyes and Jim Wallace, along with New Kent Extension Agent Paul Davis, invited the out of town guests to witness first-hand the changes occurring across this area by visiting the farms of David Hula, Frank Hula, David Black, Louis Aigner and sons, and Archer Ruffin.

Participant John Kimble, USDA/NRCS Soil Scientist in Lincoln, Nebraska, expressed that ICS is an "innovative program" of farm management "tied to off-site benefits such as improved water quality." Ron Follet, USDA/ARS Soil Plant Nutrient Research Leader from Fort Collins, Colorado, added, "agriculture is the solution to a lot of environmental problems" and ICS has a major role in that solution.

The following day, a larger audience representing major Virginia agricultural and environmental partners was invited to participate in a forum meeting about the future of ICS, soil quality, and Virginia agricultural productivity. The meeting initiated a strategic plan for the ICS project, with input from producers, agricultural crop associations, government agencies, and researchers.

The number one goal echoed by the participants was to maintain the profitability of farming without increasing costs for consumers. Area farmer Jon Black was candid in voicing his desire to reduce the survival of producers on government "handouts" such as incentive programs. Selling carbon credits or water quality credits may be the future for farmers who want to increase their income with agricultural practices that conserve the environment.

Research and education were the two additional goals generated by the group discussion. David Black expressed his interest in having solid data from reputable scientists to back up local experience. Practicing conservation methods work for him, but he knows that others will need additional information to change from traditional management. In addition, the general public will benefit from understanding the effects farmers have on improving the environmental and economic health of this state.

Producers in this area are on the forefront of an agricultural movement that increases yields and reduces costs, and even improves the environment around them through the reduction of runoff, erosion, and loss of carbon to the atmosphere. And that benefits us all by maintaining our food supply, improving water quality, and making Virginia a healthy place to live.

News Release written by Kelley Bartell, Colonial SWCD Education Coordinator; May 22, 2001

Virginia Corn Growers Association

Virginia Corn and Soybean Conference Draws Large Support

by Joi Dyer

The 2001 Virginia Corn and Soybean Conference held on February 5th –7th, 2001 at the Williamsburg Marriott in Williamsburg, VA drew over 500 farmers, exhibitors, and supporters of the corn and soybean industries from across Virginia.

In keeping with year's theme, "A Brighter Future for Virginia Agriculture," speakers addressed new technologies and techniques that would enable farmers might to better cope with the ever-changing industry.

No-till production was a key topic.

Brian Noyes, Conservation Specialist/District Coordinator for the Colonial Soil and Water Conservation District in Charles City, New Kent, James City, and York Counties, as well as the City of Williamsburg, spoke on the "Cost Share Considerations of Continuous No-Till Systems." He stressed that no single component will make no-till work.

"The farmers are the engines that make the wheels turn," states Noyes. It requires that farmers work together and get this system into place, they will be able to prove the capabilities of this system.

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irginia Corn and Soybean Conference

Cont. from Page B-2

"This management tool is treating the soil resource directly. It improves the aerability and organic material of the soil, therefore improving the response of the seed to the soil environment," emphasizes Noyes.

Dr. Mark Alley, certified crop advisor/professional agronomist/professional soil scientist at Virginia Tech spoke of the research being conducted on Camden Farms in Caroline County. Dr. Alley and his colleagues are currently examining three rotations in no-till soil tems, the yield in- ases, and the consider- ations needed for these systems. This project is in its third year.

Ron Mulford, Farm Manager for the Poplar Hill Facility of the Lower Eastern Shore Research and Education Center of the University of Maryland, his research. Mulford is widely recognized for his applications research that is conducted both independently and in association with numerous university and agribusiness cooperators. Mulford's research has focused on systems crop management with small grains, corn, grain sorghum, and soybeans. Mulford also discussed his work with intensive crop management, both no-till and conventional production.

Dr. John F. Bradley finished the session on no-till cropping systems discussing the steps in necessary for "Continuous No-Till Cropping System in the Eastern United States." Dr. Bradley is a conservation tillage specialist for Monsanto working the Southern United States. He is currently responsible for merging new technologies with proven conservation tillage practices for sustainable agriculture.

A producer panel shared their experiences with continuous no-till cropping systems. David Hula of Renwood Farms described his success with no-till systems earned him top honors on yields at both the state and national levels. Other panel members included Jamie Jamison, a Maryland Producer and Chairman of the Production and Stewardship Team of the National Corn Growers Asso-

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Virginia Corn And Soybean Conference

Cont. from Page B-5

ciation (NCGA); Bruce Holland, Accomac County Producer; and Paul Davis, Extension Agent for New Kent County.

Throughout this three-day event, other extension agents, farmers, and researchers spoke on advantageous resources to use and help promote agriculture and environmental stewardship within the Virginia agriculture industries.

Extension agents, farmers, and researchers spoke throughout this three-day event. Their discussions presented research, experience and resources to promote agriculture and environmental stewardship in Virginia.

Soil & water gets funds

New Kent — The Colonial Soil & Water Conservation District has been awarded funds to promote the voluntary implementation of management systems that result in the reduction of nutrient and sediment pollution loads from agricultural landuse.

Cooperative farmers and landowners that implement Innovative Cropping Systems can receive incentive payments of $65 per acre over a five-year period.

Innovative Cropping Systems represent practices such as Continuous No-Till and Intensive Nutrient Management, which are regarded as limit of technology. Awarded funds are the result of competitive grants applied for by the Colonial Soil & Water Conservation District, New Kent and Charles City County Cooperative Extension Service and Virginia Tech.

State funds have been made available from the Water Quality Improvement Fund and the Special Tributary Strategy Implementation Fund through the Virginia Department of Conservation and Recreation, the York Council and the James Watershed Conservation Committee.

Approximately $150,000 will be utilized for research, demonstration, financial incentives and the collection of field data to promote Innovative Cropping Systems.

More information is available by contacting the following agencies, The Colonial Soil & Water Conservation District at 804 932-4376, New Kent Cooperative Extension at 804 966-9645 or the Charles City County Cooperative Extension at 804 829-9241.

Deadline for applications is July 6.

National Corn Growers Announces Winners

Virginia Fields Produce Top Prizes in Two Categories

by Jeff Ishee

Francis Childs of Manchester, Iowa, produced 357 bushels per acre to reclaim first place in the 2000 National Corn Yield Contest. The popular National Corn Growers Association contest drew more than 3,500 farmers from throughout the nation.

While they earned him the top prize in the 2000 contest, Childs' yields were down significantly from his 1999 record yield of 393 bushels per acre - citing a hailstorm that reduced his plant population and lowered his overall yield.

"It's interesting to note that the majority of the winners were east of the Mississippi River," said National Corn Growers Association President, Lee Klein of Battle Creek, Nebraska. "Growers in eastern states who endured devastating droughts in previous years finally enjoyed better-than-ideal growing conditions this year."

Indeed, it is not often that we see Virginia or West Virginia farmers on the list of winners in the National Corn Yield Contest. But this year, with excellent weather conditions and an overall bumper crop of corn in the Old Dominion, was certainly different.

Taking the top prize in the nation in the Class "A" non-irrigated category was James Justice of Beckley, West Virginia, who produced the extraordinary crop of corn on a field in Goochland County, Virginia. He used Pioneer variety 3245, which produced 265 bushels per acre, placing first in the nation in the Class "A" non-irrigated category.

Another prizewinner was David Hula of Charles City, Virginia, who took first place in the nation in the Class "A" No-Till Non-Irrigated category. Hula also used a Pioneer variety, specifically the 33Y11 variety. His field in eastern Virginia yielded 308 bushels per acre, which, once again, was the best in the nation in the Class "A" no-till, non-irrigated category.

Winners of this year's NCYC will be recognized at the 2000 Commodity Classic, the annual combined convention and trade show of the National Corn Growers Association and the American Soybean Association, February 25-27, 2001, in San Antonio, Texas. Along with national recognition, winners receive prizes from participating seed and crop protection companies. A complete list of winners is posted on the NCGA web site: www.ncga.com.

Conservation Technology Information Center

Equipping agriculture with realistic, affordable and integrated solutions.

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May 30, 2001

CF Industries
National Watershed Award
The Conservation Fund
P.O. Box 1889
Shepherdstown, West Virginia 25443

RE: Innovative Cropping Systems Program
Colonial Soil and Water Conservation District

The Conservation Technology Information Center (CTIC) proudly supports the nomination of the Innovative Cropping Systems program for a CF Industries National Watershed Award.

CTIC learned of the Colonial Soil and Water Conservation District's innovative program this year during our ongoing search for Core 4 Conservation success stories – partnership efforts that exemplify how conservation can be linked with profitability for America's farmers. In many ways, the Innovative Cropping Systems program demonstrates that through cooperation, communities can achieve Better Soil, Cleaner Water, Greater Profits and a Brighter Future.

In researching an article about the program for the May/June 2001 issue of CTIC's magazine, *Partners*, we learned about the innovative farmers that inspired the program, the dynamic partnership that drives the program, and the impressive results that will guarantee the success and longevity of the program. David Black, for example, is a long-time no-till farmer who was so convinced of the economic and environmental benefits of no-till and nutrient management that he helped convince the District to start the ICS program. That is a true grassroots effort.

From that beginning, the ICS program has grown through dedication, word of mouth and, of course, incentives. The money is a crucial aspect of the program, however, the education and outreach efforts of the program coordinators and volunteers, like David Black and other farmers, make this program truly special. While an incentive payment may tempt a farmer to switch to no-till, the actual behavior change will not likely happen until he/she hears first-hand about how no-till has worked for a neighbor.

1220 Potter Drive, Room 170, West Lafayette, Indiana 47906-1383 Tel: (765) 494-9555
Fax: (765) 494-5969 Web site: www.ctic.purdue.edu E-mail: ctic@ctic.purdue.edu

The ICS program is a partnership effort that promotes long-term no-till and nutrient management while providing technical and social support to the participating farmers. In other words, the ICS program is working toward improving soil quality, protecting water quality, generating greater profits for farmers and providing a brighter future for the agricultural community in Virginia.

CTIC enthusiastically recommends the ICS program – a Core 4 Conservation Success Story – for the CF Industries National Watershed Award.

If you have questions, please feel free to call me at 765-494-9555.

Sincerely,

John A. Hassell
Executive Director

COMMONWEALTH of VIRGINIA

Office of the Governor

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

May 23, 2001

W. Brian Noyes
Conservation Specialist / District Coordinator
Colonial Soil and Water Conservation District
Post Office Box 190
Quinton, Virginia 23141-0190

Dear Mr. Noyes:

I am delighted to express my support for the Innovative Cropping Systems (ICS) project. The ICS project is clearly worthy of a nomination for the CF Industries National Watershed Award and it is my pleasure to be used as a reference for the application. I suspect the project will do quite well when evaluated based on the award's various criteria.

Governor Gilmore and I take pride in the innovative approaches to improving water quality being utilized all over Virginia to protect the Commonwealth's rivers and the Chesapeake Bay. Local partnerships like the ICS project have been one of the cornerstones of Virginia's successful efforts to reduce nutrients and sediment entering the waters of the Commonwealth.

As you know, I had the opportunity to see the ICS project in use at the Good Luck Farm in your Conservation District. The farmers participating in the ICS project can take pride in the fact that they are having a real impact on the water quality of the lower York and James Rivers.

Thank you for bringing this opportunity to my attention. If I can be of further assistance in this matter feel free to contact my office.

Very truly yours,

John Paul Woodley, Jr.

John Paul Woodley, Jr.

JPW/rb

P.O. Box 1475 • Richmond, Virginia 23218 • (804) 786-0044 • TDD (804) 786-7765

JAMES RIVER ASSOCIATION
Preserving Virginia's River

May 31, 2001

Dr. H. Jackson Darst
Colonial Soil and Water Conservation District
P.O. Box 190
Quinton, VA 23141

Dear Dr. Darst:

The James River Association has reviewed the Program Narrative nominating Colonial Soil and Water Conservation District farmers participating in the Innovative Cropping System (ICS) project for the CF Industries National Watershed Award. Our review focused on examining the requirements for eligibility for this award, including innovative, non-regulatory approaches to improving water quality throughout the James and York watersheds, as well as the effectiveness of the ICS project in promoting local partnerships that demonstrate economic incentive, education, and voluntary initiatives. The ICS project exceeds these requirements.

The James River Association endorses ICS as one of the most effective means for achieving water quality goals on agricultural land, as outlined in the Tributary Strategies, and believes that the increasing implementation of ICS by farmers throughout these watersheds will lead to significant reductions in sediment, phosphorus and nitrogen loadings to the James and York rivers. Additionally, the cost-effectiveness of ICS, based on the pilot financial incentive program offered to participants in the project, results in substantial taxpayer savings.

The James River Association has worked for almost twenty-five years with staff from the nominating district, and we are confident of their ability to continue to successfully foster partnerships through the ICS project, which is instrumental in the continuation and expansion of this program. We also believe that the staff has the expertise necessary to ensure long-term funding for this project, in order to continue financial and technology-based incentives.

We support your nomination of the Innovative Cropping System project, implemented by farmers throughout the Colonial Soil and Water Conservation District, for the CS Industries National Watershed Award, and believe that participants in the project deserve this prestigious recognition.

Sincerely,

Patricia A. Jackson

Patricia A. Jackson
Executive Director

Virginia Soybean Association

151 Kristiansand Drive • Suite 115 E & F
Williamsburg, VA 23188
Bus. 757-564-0153 • Fax: 757-564-8165 • E-mail: soybean@visi.net
Affiliated with the American Soybean Association

July 5, 2000

Colonial Soil & Water Conservation District
USDA Quinton Service Center
2502 New Kent Highway
P.O. Box 190 Quinton, VA 23141-0190

Dear Mr. Ruffin:

This letter is to inform you of the support from our membership for the cooperative project to promote technologies in the form of Continuous No-Till Management Systems. The Virginia Soybean Association's committee chairs have reviewed the package of information provided on your project and have determined that it is a valuable innovation with applications for soybean producers. We endorse the Innovative Cropping Systems Incentive Program (ICS) and hope to hear more about its performance and benefits in the near future.

Sincerely,

Susan C. Haller

Susan C. Haller, Executive Director

C: David Holshouser
Bill Nelson

VCGA, Inc.

VIRGINIA COTTON GROWERS ASSOCIATION, INCORPORATED

P.O. BOX 27552 • RICHMOND • VIRGINIA • 23261 • (804) 784-1341 • Fax (804) 784-2588

June 28, 2000

Brian Noyes, Conservation Specialist
Colonial Soil and Water Conservation District
USDA Service Center
2502 New Kent Highway
P.O. Box 190
Quinton, Virginia 23141-0190

Dear Brian,

On behalf of the Virginia Cotton Growers Association I am writing to convey our support for making the Innovative Cropping System a permanent state cost share program. The advantages of continuous no-till as a production practice, to both farmers and the Commonwealth's environment, are obvious. I would think that this technique has far-reaching implications and applications to counties other than those within the Colonial SWCD, thereby greatly increasing the potential for benefit.

No-till planting is an accepted production practice with cost savings to farmers and benefits to our waterways through reduced soil erosion and nutrient run-off. As an organization representing cotton farmers, most of whom also grow other field crops, we support both of these concepts wholeheartedly.

No-till planting is a farming technique for the long-term and we are confident the state of Virginia will formally recognize the critical role ICS can play in helping to address non-point source pollution issues. We hope the state, through the Virginia BMP Cost Share Program, will support the efforts of the Colonial SWCD and those farmers currently using ICS along with those willing to try, and ultimately embrace, this practice.

Sincerely,

Spencer Neale, Jr.
Secretary

VIRGINIA SMALL GRAINS ASSOCIATION

May 29, 2000

The Honorable John Paul Woodley, Jr.
Virginia Secretary of Natural Resources
c/o Colonial Soil & Water Conservation District
P. O. Box 190
Quinton, VA 23141

Dear Secretary Woodley:

The Virginia Small Grains Association enthusiastically supports the Innovative Cropping Systems Incentive Program (ICS). We see the results of this project as offering great benefits to grain farmers in the eastern part of the Commonwealth, while, at the same time, protecting our valuable water sources. As has been demonstrated at the Good Luck Tract in Charles City County, Continuous No-Till Management Systems have produced significant production advantages. The adoption of the ICS Program would help ease the financial and technological obstacles that many farmers face as they try to incorporate No-Till Management Systems into their own operations.

Again, we encourage the implementation of the ICS Program. Should you have any questions or require further information on our part, please do not hesitate to let me know.

Sincerely,

Delores C. Darden

Delores C. Darden
President
Virginia Small Grains Association

P. O. Box 603 West Point, VA 23181 * 804-843-4456 * 800-446-3615 * Fax 804-843-3629 * email:eded@inna.net

UNITED STATES
DEPARTMENT OF
AGRICULTURE

NATURAL
RESOURCES
CONSERVATION
SERVICE

1606 Santa Rosa Road
Suite 209
Richmond, Virginia 23229-5014
Tel. (804) 287-1690
FAX (804) 287-1736

July 20, 2000

JUL 21 2000

Mr. W. Brian Noyes
Conservation Specialist
Colonial Soil and Water Conservation District
2502 New Kent Highway, P.O. Box 190
Quinton, Virginia 23141-0190

Dear Mr. Noyes,

On behalf of the USDA, Natural Resources Conservation Service, I would like to take this opportunity to formally endorse the Colonial SWCD efforts to recognize the participating farmers for the CF Industries National Watershed Award.

These individuals are true pioneers in their efforts to improve water quality through innovative farming techniques. Their dedication, interest, and willingness to experiment and be innovative with new techniques are indeed admirable. They are serving as role models and their efforts are setting the standard for the development of a major statewide initiative to improve water quality in the Commonwealth.

Having witnessed the cropping techniques firsthand, I can attest to excellent improvement in erosion control, sediment reduction, and downstream water quality improvement. The participants all share a commendable ethic to manage their land and related natural resources in a wise and sound manner, and to constantly be on the watch to make further improvements. These individuals are true stewards of our natural resources.

KENNETH E. CARTER
State Resource Conservationist
USDA, Natural Resources Conservation Service
Richmond, Virginia

VIRGINIA SOIL & WATER CONSERVATION

Tidewater Soil and Water
Conservation District
P. O. Box 677
Gloucester, Virginia 23061
(804) 693-3562, ext. 5

June 9, 2000

Brian Noyes, Conservation Specialist
Colonial Soil and Water Conservation District
USDA Quinton Service Center
P. O. Box 190
Quinton, VA 23141-0190

Dear Brian:

The Tidewater Soil and Water Conservation District is pleased to endorse the providing of cost share funding to farmers desiring to make the transformation from conventional management systems to continuous no-til management systems. The fine work you have done in the Colonial District has demonstrated the superiority of these systems in reducing sediment and nutrient deposition in state waters. Financial assistance to farmers wishing to adopt these management systems will further help meet the goals of Virginia's Tributary Strategy Initiatives.

Sincerely,

Marilyn W. Layer
Chairman

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural Resources

David G. Brickley
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street, Suite 302

TDD (804) 786-2121 Richmond, Virginia 23219-2010 (804) 786-6124 FAX (804) 786-6141

August 2, 2000

C. F. Industries National Watershed Award
c/o The Conservation Fund
P. O. Box 1889
Shepherdstown, West Virginia 25443

Re: Nomination Support for Colonial Soil & Water Conservation Districts Farmer Participant in Innovative Cropping Systems National Watershed Award

Attention Nomination Committee:

Please accept this letter of reference concerning the Innovative Cropping Systems Incentive Program (ICS) of the Colonial Soil and Water Conservation District. I fully support ICS and endorse the nomination of the program farmers participating in ICS for the CF Industries National Watershed Award. The ICS program demonstrates that sound environmental practices are not only good for the quality of the waters of the Commonwealth, but can be profitable and useful to the farmer.

I believe the farmer participants in the ICS program fully satisfy the criteria that are critical in your evaluation in providing true stakeholder representation, community outreach, innovative nonregulatory action, interdisplinary approach, and achievement of measurable goals. They are outstanding examples of those honored to receive the C.F. Industries National Watershed Award.

If I can be of further assistance or can answer any questions, please feel free to give me a call.

Sincerely,

David G. Brickley

cc: Brian Noyes, Colonial SWCD

C:\ALLDOCS\dgb\letters\CG Industries.doc

ICS & Soil Quality Professional Training
Program Evaluation

Poor Good

- Was the training applicable to your scope of work?

  1-2-3-4-5-6-7-8-9-10

- Did the speakers provide the information in a manner that you could understand?

  1-2-3-4-5-6-7-8-9-10

- Were the facility/tour transport/meal accommodations adequate?

  1-2-3-4-5-6-7-8-9-10

- Did you obtain a better perspective of the national importance of ICS & Soil Quality?

  1-2-3-4-5-6-7-8-9-10

- Did you obtain a better perspective of the local importance of ICS & Soil Quality?

  1-2-3-4-5-6-7-8-9-10

- How would you rate the natural resource conservation aspects provided in the training?

  1-2-3-4-5-6-7-8-9-10

- How would you rate the agronomic aspects provided in the training?

  1-2-3-4-5-6-7-8-9-10

- Please rate the overall program. 1-2-3-4-5-6-7-8-9-10

Please provide any additional comments. _____

_____

_____

_____

Soil Quality Test Kit
Results for Fall 2001 (cont.)

Site Name	CEC	O.M. %	Est. N Release	pH	P1	K	Bulk Density	Organic Amends	Prev. Crop	Rotation
Hill's (No-Till)	4.2	2.1	86	6.5	125	116	1.38	Sludge Sp 2001	Corn	Cr, Sm Gr, Sb
Hill's (Tilled)	4.8	1.9	81	7.2	133	120	1.32	Sludge Sp 2001	Corn	Cr, Sm Gr, Sb
Sunny Side (No-Tilled	6.5	2.8	97	7.3	203	79	1.37	Sludge Sp 2001	Corn	Cr, Sm Gr, Sb
Sunny Side (Tilled)	3.8	2.5	95	6.8	205	71	.89	Sludge Sp 2001	Corn	Cr, Sm Gr, Sb
Good Luck	4.5	3.0	104	5.6	98	59	1.42	Sludge Sp 1998	Corn	Cr, Sm Gr, Sb

Soil Quality Test Kit
Results for Fall 2001

Site Name	Operator	Conditions	Soil Type	Years in NT	Date Collected	Infilt. Rate	Respir. Rate	Soil Temp	No. of Earthworms
Hill's (No-Till)	Davis	1.2" rainfall 2 nights before	Conetoe	3	9/11/01	2 min. 6 min.	20.93 G/cm3	74.3 F 72.5 F 72.7 F	11
Hill's (Tilled)	Davis	1.2" rainfall 2 nights before	Conetoe	N/A	9/12/01	42 min.	27.02 G/cm3	72.9 F 70.3 F 69.6 F	6
Sunny Side (No-Till)	Davis	1.2" rainfall 2 nights before	Pamun key	3	9/12/01	17 min 31 min	20.76 G/cm3	72.0 F 68.0 F 71.2 F	2
Sunny Side (Tilled)	Davis	1.2" rainfall 2 nights before	Pamun key	N/A	9/12/01	< 2 min 6 min	20.71 G/cm3	70.7 F 67.3 F	2
Good Luck	Black	½ " rainfall 3 nights before	Caroline	11	9/27/01	15 min 22 min	8.21 g/cm3	73.8 F 73.0 F 70.5 F	0

2001 VIRGINIA TECH ON-FARM CORN TEST PLOTS

A SUMMARY OF REPLICATED RESEARCH CONDUCTED BY VIRGINIA COOPERATIVE EXTENSION IN COOPERATION WITH LOCAL PRODUCERS

Conducted and Summarized By:
Paul Davis, Extension Agent, New Kent County
Keith Balderson, Extension Agent, Essex County
Dan Brann, Extension Agronomist, Grains
Chris Lawrence, Extension Agent, King William/King & Queen County
David Moore, Extension Agent, Middlesex County

Sponsored by:

Virginia Corn Board
Virginia Cooperative Extension

INTRODUCTION

The research and demonstration plots discussed in this publication are a cooperative effort by four Virginia Tech Extension Agents, Donna Tuckey, IPM Area Specialist, numerous producers, several Extension Specialists, a local Soil and Water Conservation District, and members of the agribusiness community.

The field work and printing of this publication is mainly supported by the Virginia Corn Check-Off Fund. Any corn producer that would like a copy should contact their local Extension Agent, who can request a copy from the New Kent County Extension Office.

This is the tenth year of this multi-county cooperative project. Further work is planned for 2002.

The authors wish to thank the many producers and agribusinesses that participated in these research plots. Special thanks are due to Frances Lemons in the New Kent Extension Office for her efforts in helping to put this book together.

The use of trade names in this report does not imply endorsement of the product named or criticism of similar ones not mentioned.

TABLE OF CONTENTS

General Summary

These replicated studies provide information that can be used by corn growers to make better management decisions. Refer to individual plots for discussion of results.

A. Poultry Litter worked good ahead of No-Till corn in the rotation. Litter will provided needed P, and N if not applied too far ahead of planting (<60 days), sidedress N is needed to make maximum economic yields. Nutritional value, along with the cost of the litter, hauling and spreading need to be calculated prior to committing to large tonnages of litter.

B. In 16 of the 20 ripped vs. not ripped plots, there was at least a small yield increase with ripping. Over the 20 plots, ripping increased corn yields by 6 bu/ac, which is a breakeven situation at best. Soil type and soil conditions caused yields to vary from 22 bu less to 29 bu more per acre due to ripping.

C. Seed corn insecticide treatment, supplier treated, were evaluated as replacements for hopper box and soil in-furrow insecticide treatments. Gaucho seed yielded 3 bu better than Kernal Guard and 8 bu better than untreated seed both giving overall profits. Prescribe seed gave a 2 bu yield increase over Gaucho but due to its cost overall profit was $7.78 less per acre. Proshield treated seed yielded 3 bu more than untreated but overall profits were less with Proshield.

D. As a source of Nitrogen for sidedressing corn both 30% UAN and 24-0-0-3 work equally as well.

E. Corn hybrids differ greatly in yield, drought tolerance, standability and disease resistance so you may want to use these corn hybrid comparison and challenge plots to assist in your hybrid selections for future planning.

Utilizing Poultry Litter in No-Till
Corn Production in Coastal Plains, VA

Producers:	Frank & Mick Hula, Riverside Farm, Charles City, VA
Cooperators:	Sonny Meyerhoff, Double M Trucking Co.; Jim Wallace & Brian Noyes, Colonial SWCD; Whit Stoddard, Southern States, King William Store; Paul Davis & Vernon Heath, VCE, New Kent and Charles City
Previous Crop:	No-Till Cotton
Hybrid:	Pioneer 3245
Tillage:	No-Till in 30 inch rows
Population:	25,000 dropped; 23,000 actual harvested
Soil Type:	Pamunkey, fine sandy loam
Planted:	April 17, 2001
Fertilizers:	Starter: 30-30-0 all treatment Sidedress: Commercial Fertilizer – 150 #N; 4 ton litter rate - 0 #N;
Poultry Litter-4/16/01:	3 ton litter rate + 50 #N; 2 ton litter rate + 100 #N
Poultry Litter Analysis lbs/ton not incorporated:	N - P - K - Ca - Mg 38 - 38 - 36 - 22 - 12
Herbicides:	1.8 qts. Atrazine + 3 pts Princep + 1 qt. Roundup Ultra
Insecticides:	2 oz. Warrior pre-plant
Fungicides:	None
Seed Treatments:	Kernel Guard
Harvested:	September 12, 2001 (6 rows x 500 ft.)

	Yield bu/Ac				(bu/Ac)	Avg. %
Treatment	Rep 1	Rep 2	Rep 3	Rep 4	Avg. Yield	Moisture
Comm. Fertilizer 150# N Sidedress	188.6	189.6	202.8	201.0	195.5	25.8%
2 tons litter + 100 #N Sidedress	176.5	187.5	200.1	182.0	186.5	24.6%
3 tons Litter + 50 #N Sidedress	202.9	191.3	205.8	205.6	201.4	21.6%
4 tons Litter + no sidedress N	168.4	177.4	191.0	170.5	176.8	24.2%

Plant Tissue and Soil Analysis

							Organi
March 9 Pre-application	pH	N	P	K	Mg	Ca	% Matter
(3 inch soil sample)	6.1	-	(VH)45	(VH) 181	(VH) 197	(VH) 760	1.6%
September 27 Post-harvest							
(3 inch soil sample)							
Comm. Fertilizer	6.2	(L) 8	(VH) 44	(VH) 154	(VH) 182	(M) 670	2.3%
2 tons litter	6.1	(L) 8	(M) 39	(VH) 149	(VH) 229	(M) 790	2.5%
3 tons litter	6.3	(M) 12	(H) 38	(VH) 223	(VH) 195	(M) 790	2.7%
4 tons litter	6.2	(M) 14	(H) 37	(VH) 184	(VH) 183	(M) 690	2.4%

Plant Tissue Analysis at Sidedress and Silking

Tissue %N	Commercial Fertilizer	2 ton	3 ton	4 ton
May 28 (whole plant)	(H) 4.9%	(M) 4.4%	(H) 4.7%	(H) 4.6%
June 28 (ear leaf)	(H) 3.3%	(H) 3.4%	(H) 3.4%	(H) 3.3%

Soil Nitrate Analysis of Top 12 Inches

Soil Nitrate ppm (top 1 ft.)				
May 28 (presidedress)	(H) 26	(H) 24	(H) 25	(H) 25
September 27 (post harvest)	(L) 6	(L) 6	(L) 6	(L) 8

Discussion: Poultry Litter cost $16.00/ton delivered to the field from Shenandoah Valley plus spreading cost will run between $4-$7 per ton. So the actual cost for litter per acre was $44 at 2 tons; $66 at 3 tons and $88 at 4 tons. As you see from the yields, combinations of litter + sidedress Nitrogen and litter alone can produce yields equal too and above commercial fertilizer. Plant tissue and soil nitrate analysis showed no significant differences in treatments throughout the growing season. Even at the higher rates of litter and sidedress Nitrogen the soil $N0_3$ levels at 12 inches after harvest were in the low range 6-8 ppm. The soil $N0_3$ samples at the 3" depth showed a higher $N0_3$ level at the 3 and 4 ton rates, 12 ppm and 14 ppm respectively, than no litter and 2 tons, 8 ppm each.

The litter cost $6/ton in Harrisonburg, VA and $10/ton trucking to Charles City, VA (150 miles). Only $10/ton because of backhaul with cotton seed. The plant nutritional value of this litter was around $25/ton (38-38-36 plus some micronutrients). Six dollars for $25 of plant nutrients is a great deal, but when you add in hauling, loading and spreading it doesn't look quite as good.

There are soil quality benefits associated with using litter, especially in a continuous No-Till cropping system, and it can satisfy a corn crops need for Nitrogen, Phosphorus and Potassium at the right rates. But because of storing, covering, spreading, odor and cost of hauling I don't see a great deal of demand for this product, at today's plant food commercial fertilizer prices, in Eastern Virginia.

Poultry Litter vs. Commercial Fertilizer Challenge Plot

Cooperators

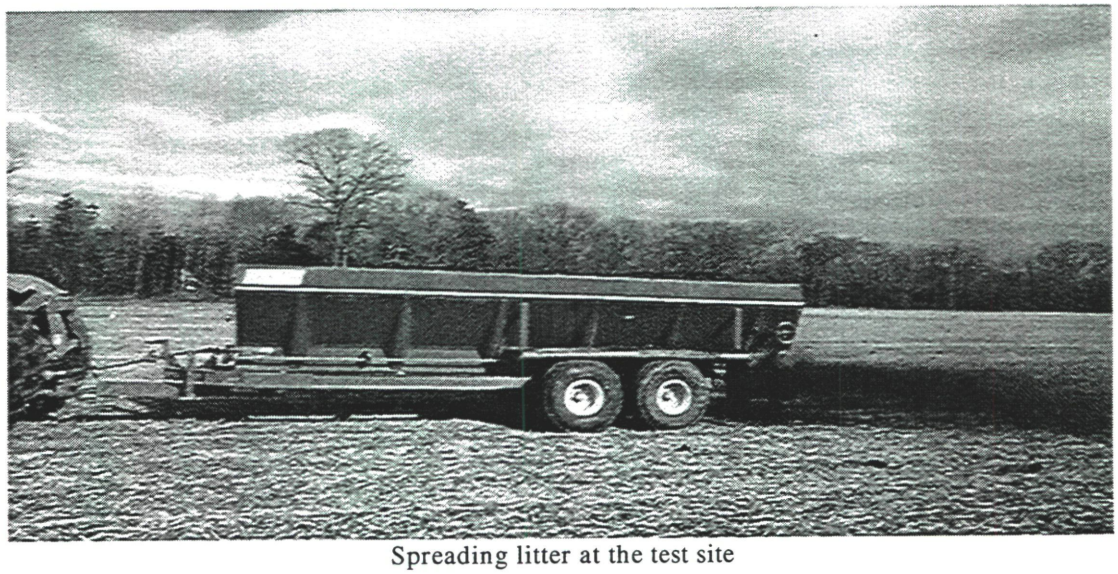
Producer:	Philip Minor Farms
Landowner:	Jack Spain
VA Cooperative Extension:	Chris Lawrence, King & Queen/King William Keith Balderson, Essex David Moore, Middlesex Dr. Greg Mullins, VA Tech Mike Brosius, VA Tech Randy Shank, Chesapeake Bay Coordinator
Other agencies:	Terry Moss, Dept. of Conservation & Recreation (DCR) Scott Ambler, DCR
Agribusiness:	Bruce Ball, Southern States, King William

Acknowledgement

We very sincerely thank Philip and everyone at Philip Minor Farms for donating an immense amount of time and resources to this project and to a number of other litter plots.

Objective

To demonstrate the agronomic and economic advantages/disadvantages of substituting poultry litter for commercial fertilizer in our traditional cash grain rotation.



Spreading litter at the test site

Field Information and Production Practices

Field location:	Bewdley Farm, King & Queen County
Field history:	In the 40 years prior to this plot, the field received no manure, sludge, or other amendments other than commercial fertilizer. Also no crops were grown other than corn, soybeans, and small grain.
Soil types:	State and Tetotum
Yield potential:	approx. 150 bu/A
Previous crop:	Full-season soybeans
Plot layout:	6 side-by-side replications of about 4 acres each (total plot size: 25 acres)
Tillage:	No-till. At least 3 years continuous no-till corn/soybeans prior to this plot.
Hybrid:	Pioneer 33K81
Planting date:	April 10, 2001
Population:	21,000 in 30" rows (stand counts were made in field)
Herbicides:	Preplant:1.6 qt. Bicep II, 1.5 pt. Princep, 0.75 pt. Atrazine, 0.5 pt. 2,4-D
Insecticides:	Force in furrow at planting
Soil test data:	VA Tech: pH above 6.2 (no lime needed); Medium P; Low K.
Litter/fertilizer:	See below for details on treatments.
Harvest date:	September 18, 2001

Fertility Treatments

Litter Application Rate and Timing

As required by Maryland's litter transport cost-share program, we based our litter application rate on a site-specific "N- and P-based" nutrient management plan. In this particular case, P was the limiting nutrient. We were not allowed to spread more litter than was needed (based on soil test recommendations) for three crops, including this corn crop.

We did extensive soil sampling at the test site prior to spreading litter and fertilizer. We divided the test area into treatment zones of about 2 acres each and took separate soil samples for each zone. More details about the soil testing can be found elsewhere in this publication. We formulated our overall litter application rate to meet the P needs of the zones with the lowest soil test P level. Some zones tested as low as Medium (M) for P and Low (L) for K. Since the VA Tech lab calls for 60 pounds P_2O_5 per acre per crop in this situation, our overall P application limit was 180 pounds P_2O_5 per acre (3 crops x 60 lb/A each).

The litter contained about 60 pounds P_2O_5 per ton, so we aimed to put out about 3 tons per acre to all portions of the test site receiving litter. Philip spread litter on March 7 on the plot's 6 litter zones. This was about 30 days prior to the expected planting date and therefore met Maryland and Virginia guidelines for litter application timing. We estimated that Philip spread 3.1 tons per acre. The tables below show the average nutrient analysis of the litter used, as well as the pounds of nutrients applied per acre in the litter.

Average Litter Analysis

N*	P_2O_5	K_2O	Ca	Mg	S	Mn	Zn	Cu
-------- lb of nutrient per ton of litter --------								
31	56	41	43	9	11	0.8	0.9	0.7

*Estimated N available to crop in first year, no-till manure application

Average Litter Nutrients Applied per Acre (at 3.1 ton/A rate)

N*	P_2O_5	K_2O	Ca	Mg	S	Mn	Zn	Cu
-------- lb of nutrient per acre --------								
96	175	130	132	27	34	2.4	2.9	2.1

*Estimated N available to crop in first year, no-till manure application

Commercial Fertilizer Application Rate and Timing

On March 17, King William Southern States broadcast dry fertilizer on the 6 fertilizer zones. The commerical fertilizer nutrients applied, in pounds per acre, were: 86 N – 184 P_2O_5 – 135 K_2O – 16 S. On this field testing Medium (M) in P and Low (L) in K, VA Tech would normally recommend 60 lb/A P_2O_5 and 100 lb/A K_2O ahead of a corn crop. But we wanted to keep applications of P_2O_5 and K_2O consistent across the whole plot, to avoid strips of widely varying fertility levels in the future. So we tried to match the P_2O_5 and K_2O we had already applied in litter form. We did not match the litter P_2O_5 and K_2O exactly, because some litter test results were not available until later and changed our final estimate of litter P_2O_5 and K_2O content. VA Tech also does not recommend spreading so much commercial fertilizer N so far ahead of planting corn. However, the N was already "along for the ride" as a component of the diammonium phosphate (DAP) and ammonium sulfate used.

Additional N Applications

On March 28, 2001, Philip applied 25 lb/A of N to all portions of the plot with the pre-plant herbicides. No additional fertilizer was applied at planting.

The field was sidedressed on May 25. Prior to sidedressing, we took soil samples to a depth of 12" from each of the 6 zones treated with litter. The 6 pre-sidedress nitrate test (PSNT) results ranged from 20 to 23 ppm, with an overall average of 21 ppm. Virginia Tech and DCR guidelines indicate that corn fields fertilized with manure and showing PSNT results of 20 ppm or higher generally do not benefit from additional sidedress N applications.

In consultation with Philip, we decided to apply a sidedress N application of 60 lb/A to the fertilizer zones. Since all litter zones tested at or above the 20 ppm PSNT threshold, we also decided to apply only a half rate of sidedress N (30 lb/A) to the litter zones. Note: the PSNT is calibrated only for soils that have received manure, sludge, etc. So there was no reason to run the PSNT on fertilizer zone samples.

Summary of Fertility Treatments

Summary of Fertility Treatments

Event	Date	Litter Treatment				Commercial Fertilizer Treatment			
		N	P_2O_5	K_2O	S	N	P_2O_5	K_2O	S
		--- lb nutrient per acre ---				--- lb nutrient per acre ---			
Litter Application	3/7/01	96*	175	130	34	-	-	-	-
Fertilizer Application	3/17/01	-	-	-	-	86	184	135	16
Herbicide Application	3/28/01	25	-	-	-	25	-	-	-
Sidedress Application	5/25/01	30	-	-	-	60	-	-	-
Total		151	175	130	34	171	184	135	16

*Estimated N available to crop in first year, no-till manure application

Yield Results

From the weigh wagon's point of view, the commercial fertilizer treatment (average yield: 144 bu/A) beat the litter treatment (average yield: 135 bu/A). The fact that the commercial fertilizer yielded more than the litter in 6 out of 6 replications makes it clear that the yield difference was due to the treatments, and not random differences in growing conditions between zones.

Yield Results

Treatment	Replication	Moisture at harvest (%)	Yield (bu/A at 15.5% moisture)	Fertilizer Yield Advantage (bu/A)
Fertilizer	1	16.6	127	+3
Litter	1	16.4	124	
Fertilizer	2	16.5	147	+10
Litter	2	16.4	138	
Fertilizer	3	16.3	150	+7
Litter	3	16.4	143	
Fertilizer	4	16.8	146	+14
Litter	4	16.9	132	
Fertilizer	5	16.5	144	+8
Litter	5	15.7	136	
Fertilizer	6	16.9	150	+12
Litter	6	16.6	138	
Averages				
Fertilizer		17.6	144	+9
Litter		17.2	135	

Why did the commercial fertilizer treatment produce more corn? We believe that sidedress N made the difference. Even though PSNT results indicated that the litter zones needed no sidedress N, we believe that our application of 30 lb/A sidedress N application to the litter zones was still not sufficient. Our reasons for suspecting N deficiency are as follows:

1. There were some symptoms of N deficiency in the corn during July. Walking through this very large plot, we could not see obvious differences in N deficiency symptoms between litter and fertilizer zones. But it is quite possible that there were differences between treatments in N deficiency too subtle to pick out with the naked eye, but serious enough to produce a 9 bu/A yield difference.

2. On June 1, a few days after sidedressing, 4.5 inches of rain fell on the plot. Historical precipitation records are available from the National Weather Service observation station in Walkerton, just a few miles away. The 4.5 inch rainfall on June 1, 2001 was the third highest one-day precipitation event observed at Walkerton in the last 50 years. We can assume this exceptional storm washed an exceptional amount of nitrate N out of the reach of corn roots, either through leaching or runoff.

3. We have learned a lot from Philip's experience with poultry litter over the past two seasons. We now believe that the N in poultry litter behaves a lot more like commercial fertilizer N than we previously thought. The litter N seems to be available for plant uptake and leaching soon after spreading. When this readily-available N is applied to sandy land two to three months prior to the corn's key N uptake period, we must either sidedress generously or expect to see some N shortage around tasseling time. This is especially true in years like this one when there are extreme rainfall events with significant leaching potential.

For the reasons stated above, we believe that the yield difference between treatments probably would not have occurred if we had made equal applications of 60 lb/A sidedress N to all zones.

Economic Analysis

Approach

We applied enough litter and commercial fertilizer P_2O_5 to meet the P needs of an entire three-crop rotation. So our cost analysis considered the savings achieved with litter over all 3 crops, not just on the first corn crop. This approach is appropriate, because P is stored for future release in soils with moderate background P levels such as these. We also applied slightly more K_2O to both the litter and fertilizer zones (around 135 lb/A) than was needed for the first corn crop (around 100 lb/A). Although more mobile than P, K can also be stored in the soil and become available for uptake by a future crop. So we also counted the excess K_2O applied as an economic benefit for the next crop.

Cost Comparison

Our analysis below suggests that the litter treatment lost the yield contest, but still represented a cost savings of almost $30 per acre over the commercial fertilizer treatment. Remember that this is a cost savings of $30 per acre over 3 crops.

Comparison of Costs per Acre Over Three-Crop Rotation

	Litter Treatment	Fertilizer Treatment
Material	$8/ton x 3.1 ton/A = $24.80	$73.50
Loading/spreading	$15.00	$6.00
Sidedress	-	30 extra lb. N x $0.29/lb = $8.70
Yield loss	9 bu. yield loss x $2.11/bu. = $18.99	-
Total	$58.79	$88.20
Savings with litter	**$29.41**	

Material costs

For purposes of this analysis, we assumed a litter cost of $8 per ton delivered to the field. Maryland litter transporters were openly quoting prices at or below $8 per ton around the time Philip received this litter. Spread at a rate of 3.1 tons per acre, the litter cost $24.80 per acre.

The cost of the dry commercial fertilizer purchased from Southern States was $73.50. As mentioned earlier, we purchased a few more pounds of fertilizer P and K than were needed to match our final estimate of the nutrients applied in the litter. If we had matched the litter P and K precisely, our commercial fertilizer cost would have been $70.33.

Loading/spreading costs

We assumed a litter loading and spreading cost of $15.00 per acre. This is our conservative estimate of Philip's total cost for labor, equipment ownership and maintenance, and fuel. The cost of loading and spreading can be difficult to estimate accurately and can vary significantly from farm to farm.

Southern States charged us $6.00 per acre to spread the dry commercial fertilizer.

Sidedress Costs

Since sidedress application costs were the same for both treatments, the only difference was the cost of 30 lb/A extra sidedress N for the fertilizer zones. We assumed a cost for N of $0.29/lb, which was reasonable for May 2001. Note that the cost of N has dropped since that date.

Yield Loss

The litter treatment produced 9 bu/A less corn grain than did the commercial fertilizer treatments. We counted this 9 bu/A deficit as a litter treatment cost. For much of the harvest period, local elevators were offering less for cash corn than the USDA loan rate for King & Queen County, which is $2.11 per bushel. Since USDA's programs are supposed to set a floor on King & Queen corn prices at $2.11 per bushel, we charged the 9 bu/A yield deficit as an additional cost of $18.99 (9 x $2.11) on the litter treatment.

Cost Comparison for Alternate Scenarios

Even after factoring the cost of the litter treatment's yield deficit, our analysis still showed the litter treatment to be $29 per acre cheaper than the commercial fertilizer treatment over the three-crop rotation. Naturally, this calculation assumed that there will be no meaningful differences in yield between the litter and commercial fertilizer zones for subsequent crops in the rotation.

As stated previously, we believe that we could have eliminated the 9 bu/A litter yield deficit by applying equal sidedress N applications of 60 lb/A to litter and fertilizer zones. If we assign equal sidedress costs to both treatments and eliminate the litter yield deficit, the cost advantage of litter over the three-crop rotation increases to about $40 per acre.

Note that subsidized litter transport is the key to making litter profitable. If we assume identical costs to those shown in the cost comparison table above, but increase the cost of litter from $8 per ton to $17.50 per ton, there is no cost advantage to using litter over commercial fertilizer.

Future Work

We plan to repeat our intensive soil sampling this winter to compare how the litter and fertilizer treatments affected soil test pH, P, and K levels.

It would also be interesting to monitor yields in the 12 treatment zones for subsequent crops. This would allow us to confirm our assumption that there will be no meaningful differences in yield between litter and fertilizer zones for subsequent crops in the rotation.

Conclusions

Here are eight of the most important lessons we've learned about substituting litter for commercial fertilizer in our traditional Middle Peninsula cash grain rotation:

1. The best fit for litter in our rotation is ahead of the corn crop. The many nutrient management planning obligations tied to Maryland litter transport cost-share now make this more true than ever.

2. You are not guaranteed to save money by using litter over commercial fertilizer for grain production. Put a pencil to it first. Carefully estimate your loading and spreading costs. And remember that transport subsidies and low-cost litter are the key to making it profitable.

3. The more P fertilizer your soil needs, the more money you'll save with litter over commercial fertilizer. For purely economic reasons, we suggest that you only consider using litter on soils with VA Tech soil test P levels of High Minus (H-) or lower.

4. Count on the N in litter being rapidly available for plant uptake. Delay spreading as long as possible before corn planting to make sure as much litter N as possible is still around during the key silking and tasseling period. If you are applying litter to several different soil types, we recommend that you apply it to the fields with the heavier soil types first. This is important from both an economic and environmental standpoint.

5. If you've spread litter ahead of corn, do not put down any additional N with herbicides or in starter. Plenty of litter N should be available to get the crop started. Save all commercial fertilizer N for a generous sidedress application.

6. If you've spread litter ahead of corn, use the PSNT to estimate how much additional N the crop needs at sidedress. If the results are anywhere near borderline, apply more sidedress N rather than less. This is especially true on light soils and if you have had intense rainfall events since spreading litter.

7. There is no "magic" to litter. On this field which had not received manure in 40 years, a moderate rate of litter didn't produce an explosion in corn growth compared to commercial fertilizer. Although you can produce as good a crop with litter as with commercial fertilizer, it may actually take extra care and management to do so.

8. Be aware of and follow the environmental rules and guidelines associated with litter, particularly if you've signed a cost-share agreement certifying that you will obey them!

Effect of Poultry Litter Application Timing on N Leaching and Corn Yield

Cooperators

Producer:	Philip Minor Farms
Landowner:	Jack Spain
VA Cooperative Extension:	Chris Lawrence, King & Queen/King William Keith Balderson, Essex David Moore, Middlesex Dr. Greg Mullins, VA Tech Mike Brosius, VA Tech Randy Shank, Chesapeake Bay Coordinator
Other agencies:	Terry Moss, DCR Scott Ambler, DCR
Agribusiness:	Bruce Ball, Southern States, King William
Student volunteer:	Chris Anthony, King & Queen

Background

In the previous plot writeup, we showed how subsidized transport of poultry litter into our area has the potential to be of significant economic benefit to grain producers. But a number of environmental rules come along with litter. One of the most problematic for grain farmers in the Middle Peninsula relates to the timing of litter applications. Virginia's guidelines basically state that poultry litter should not be spread more than 30 days before a crop is planted. The concern is that N in the litter will become available for leaching or runoff before the crop is ready to use it. Given the potential for wet weather and other unexpected problems once spreading starts, this 30-day restriction puts serious limits on the number of corn acres a grain farmer can realistically expect to cover with litter. Some area growers have questioned the need for this 30-day spreading restriction, suggesting that the N in litter might not be released so quickly. In this plot, we put the 30-day rule to the test.

Objective

To compare the amount of nitrate in subsoil water under plots treated with litter 80 days prior to planting corn and 30 days prior to planting corn.

Production Practices

Field location:	Bewdley Farm, King & Queen County
Field history:	In the 40 years prior to this plot, the field received no manure, sludge, or other amendments other than commercial fertilizer. Also no crops were grown other than corn, soybeans, small grain.
Tillage:	No-till. At least 3 years continuous no-till corn/soybeans prior to this plot.
Previous crop:	Full-season soybeans
Soil types:	State and Tetotum
Yield potential:	approx. 150 bu/A
Plot layout:	6 side-by-side replications of about 4 acres each (total plot size: 25 acres)
Hybrid:	Pioneer 33K81
Planting date:	April 10, 2001
Population:	21,000 in 30" rows (stand counts were made in field)
Herbicides:	Preplant:1.6 qt. Bicep II, 1.5 pt. Princep, 0.75 pt. Atrazine, 0.5 pt. 2,4-D
Insecticides:	Force in furrow at planting
Soil test data:	VA Tech: pH above 6.2 (no lime needed); Medium P; Low K.
Litter/fertilizer:	See below for details on treatments.
Harvest date:	September 18, 2001

Litter Treatments

As required by Maryland's litter transport cost-share guidelines, we based our litter application rates on a site-specific "N- and P-based" nutrient management plan. In this case, P was the limiting nutrient. We were not allowed to spread more litter than was needed to meet the P needs of a three-crop rotation. On this field testing Medium (M) in P, the VA Tech lab called for 60 pounds P_2O_5 per acre per crop. So we aimed to apply a total of 180 pounds P_2O_5 per acre (3 crops x 60 lb/A each). The litter for the January and March applications came from different ends of the same pile, which helps explain why N content of the litter differed for the two applications. See the previous plot writeup for details on other nutrients in this litter.

Comparison of January vs. March Litter Applications

	January Application	March Application
Application date:	January 18 (82 days prior to planting)	March 7 (34 days prior to planting)
Average litter analysis (lb nutrient per ton)	42 N* – 58 P_2O_5 – 46 K_2O	35 N* – 59 P_2O_5 – 44 K_2O
Litter application rate (tons litter per acre)	3.1	3.1
Nutrient application rate (lb nutrient per acre)	131 N* – 180 P_2O_5 – 143 K_2O	107 N* – 182 P_2O_5 – 136 K_2O

*Estimated N available to crop in first year, no-till manure application

Overall Summary of Fertility Treatments

Event	Date	January Litter Treatment			March Litter Treatment		
		N	P_2O_5	K_2O	N	P_2O_5	K_2O
		--- lb nutrient per acre ---			--- lb nutrient per acre ---		
Litter application I	1/18/01	131*	180	143	-	-	-
Litter application II	3/7/01	-	-	-	107*	182	136
Herbicide application	3/28/01	25	-	-	25	-	-
Sidedress application	5/25/01	50	-	-	50	-	-
Total		201	180	143	182	182	136

*Estimated N available to crop in first year, no-till manure application

Nitrate Leaching Results

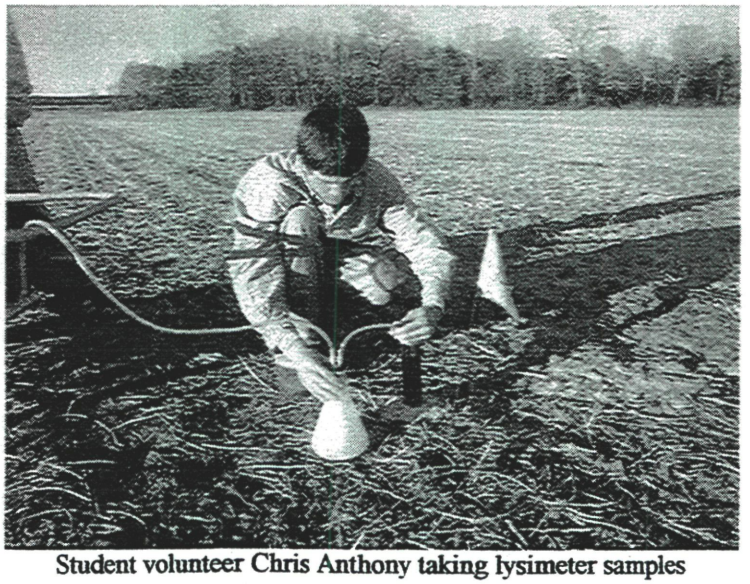
We used 18 suction lysimeters to evaluate nitrate leaching on the plot. Lysimeters are basically miniature wells installed permanently in the field. They allow you to suction water out of the subsoil from a depth of 3 feet. We installed all lysimeters prior to the January litter application. We sampled the lysimeters after most major precipitation events between late January and the end of May. We took samples from 3 feet down, because researchers agree that nitrate found that deep in the early part of the growing season is beyond the reach of corn roots and is headed to groundwater.

The graph on the next page shows the nitrate content of the water we pulled out of the subsoil through the lysimeters. Start by looking at the line for the March zones. From mid-February (before litter was applied) through late May (when the corn was 12 to 18 inches tall), the amount of nitrate N in the subsoil under these zones was essentially unchanged. We think this is because the litter was applied relatively late. By the time the nitrate N in the March litter had released and started working its way down through the soil, the crop was actively growing. So we can assume that the corn roots in the March zones were able to catch pretty much all the nitrate N that came out of the litter.

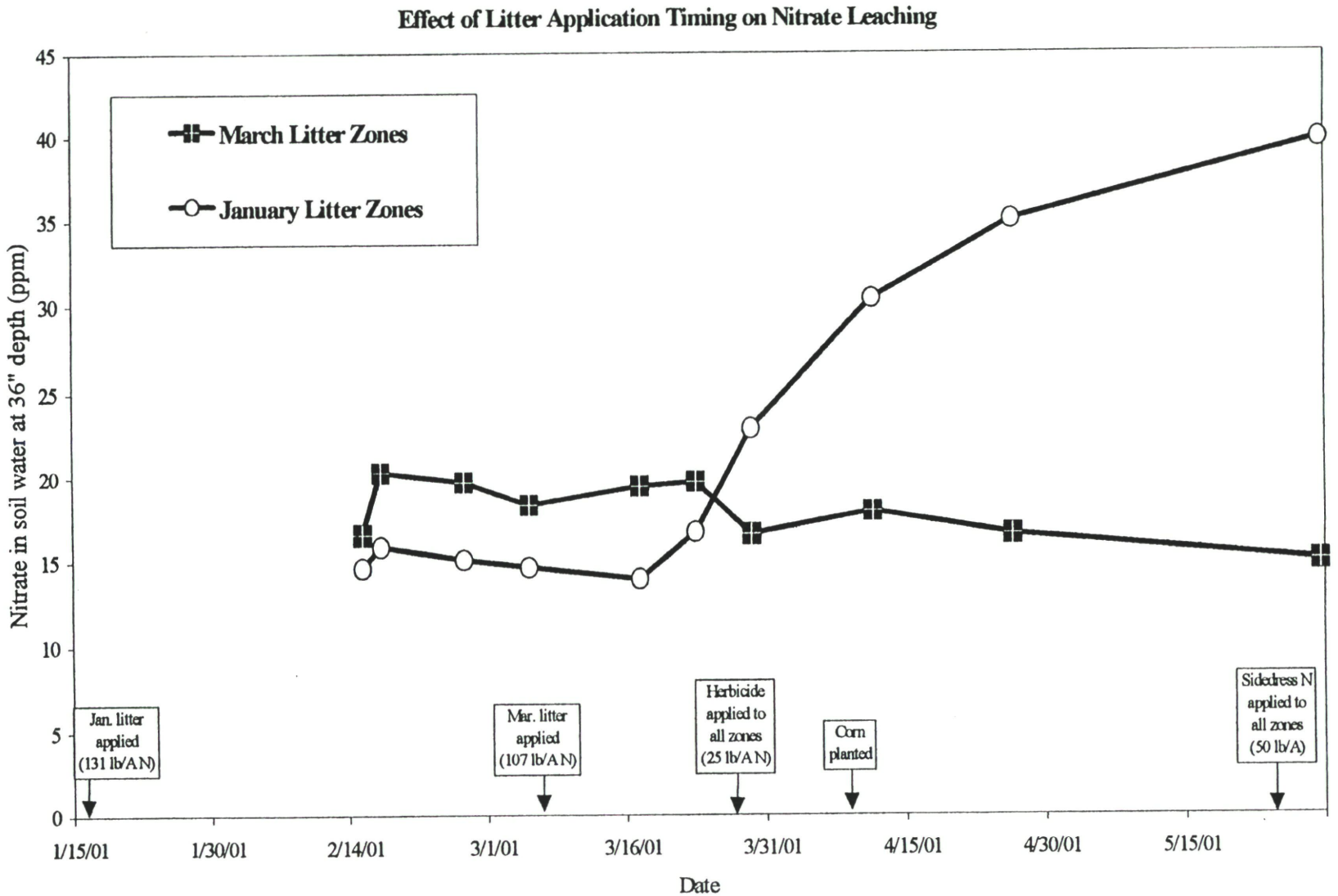
Now look at the line for the January zones. From mid-February until mid-March, the nitrate N in the subsoil under the January zones was also essentially unchanged. Then it started increasing. By the time we stopped sampling in late May, the average nitrate level at 3 feet under the January zones had almost tripled. Why? The nitrate N in the January litter just had too big of a head start on the corn. At least a portion of the N in the January litter had time to release and percolate down to a depth of 3 feet before the corn roots could catch it.

Just prior to sidedressing, we took soil samples to a depth of 12 inches and ran the pre-sidedress nitrate test (PSNT). Based on the PSNT results, we decided to apply sidedress N to all zones at a rate of 50 pounds per acre. The PSNT results help back up the lysimeter results. Prior to sidedressing, the January litter zones had received about 24 pounds per acre more N than the March zones. But in 5 out of 6 replications, the January zones still showed less available nitrate N down 12 inches than did the March zones. The most likely explanation is that some of the N applied to the January zones had already leached down beyond the 12 inch depth.

It is logical to ask if unusual weather conditions, such as warm weather or particularly heavy rains between January and March, might have caused faster N release and more leaching than in a normal winter. Unfortunately, the answer is no. Nothing significant jumped out at us when we compared the average daily temperature and rainfall data from this winter with the long-term averages from the nearby Walkerton National Weather Service observation station.



Student volunteer Chris Anthony taking lysimeter samples


Effect of Litter Application Timing on Nitrate Leaching
March Litter Zones
January Litter Zones
Nitrate in soil water at 36" depth (ppm)
45
40
35
30
25
20
15
10
5
0
Jan. litter applied (131 lb/A N)
Mar. litter applied (107 lb/A N)
Herbicide applied to all zones (25 lb/A N)
Corn planted
Sidedress N applied to all zones (50 lb/A)
1/15/01
1/30/01
2/14/01
3/1/01
3/16/01
3/31/01
4/15/01
4/30/01
5/15/01
Date

Pre-sidedress Nitrate Test (PSNT) Results

Treatment	Replication	PSNT Result (ppm nitrate N)
March litter	1	17
January litter	1	13
March litter	2	19
January litter	2	16
March litter	3	13
January litter	3	13
March litter	4	18
January litter	4	17
March litter	5	18
January litter	5	15
March litter	6	20
January litter	6	12
Averages		
March litter		17
January litter		14

Yield Results

The corn yield results do not point to any clear conclusions. The overall averages show a yield advantage of 3 bushels per acre for the March litter, but the March zones did not consistently outyield the January zones across all replications. It is possible that we applied enough sidedress N to make up for any deficiencies that might have otherwise occurred in the January zones due to loss of N through leaching. Hopefully, the lack of yield difference was the result of something more positive: Although we are certain there were more leaching losses from the January zones, it is possible the total pounds of N that leached out of the crop's reach might have been relatively small (too small to cause a major yield loss).

Yield Results

Treatment	Replication	Moisture at harvest (%)	Yield (bu/A at 15.5% moisture)	March Litter Advantage (bu/A)
March litter	1	15.8	139	+8
January litter	1	15.5	131	
March litter	2	15.7	145	+1
January litter	2	15.9	144	
March litter	3	16.1	107	-12
January litter	3	16.1	119	
March litter	4	16.3	146	+23
January litter	4	15.9	123	
March litter	5	15.6	121	-20
January litter	5	16.4	141	
March litter	6	15.7	157	+15
January litter	6	16.3	141	
Averages				
March litter		15.9	136	+3
January litter		16.0	133	

Conclusions

We undertook this study hoping to show that current restrictions on timing of litter application are unnecessarily strict. Unfortunately, the results we obtained don't support that argument. Although our lysimeter results only represent one particular field in one particular year, they show that N leaching is a real concern when litter (or any other fertilizer containing readily-available N) is applied on our sandy soils 3 or more months before a crop is ready to take it up. Loss of N through leaching is not only bad for the environment, it represents dollars lost in fertilizer value, too.

See the previous plot writeup for more specific advice on properly managing poultry litter to maximize its N value. And please follow the environmental rules and guidelines associated with litter, particularly if you've signed a cost-share agreement certifying that you will obey them.

Effect of Soil Sampling Depth on Soil Test Results and Fertilizer Recommendations

Chris Lawrence, Keith Balderson, and David Moore

Introduction

In 2001, we worked with Philip Minor to set up 2 large poultry litter plots side-by-side in a field in King & Queen. These 2 plots took up a total of about 50 acres. We did intensive soil sampling at 3 different depths on these 50 acres prior to applying litter and fertilizer. There are some lessons to be learned from the soil test results.

We conducted the soil sampling in January and February of 2001. The 50-acre test area was divided into 24 treatment zones of about 2 acres each. We took representative soil samples from each of the 24 zones. This involved taking cores from 10 or more spots within each zone. So we pulled cores from at least 240 spots across the 50-acre field (24 zones x 10 spots per zone). At each sampling spot, we took cores to three different depths: 0 to 2", 0 to 6", and 0 to 12". This means three different samples were collected from each zone, for a total of 72 composite samples (24 zones x 3 samples per zone). All samples were tested by the VA Tech Soil Testing Lab.

When we sampled, the field had been in continuous no-till soybean and corn production for at least 3 years.

Results and Discussion

When looking at the soil test results, keep in mind VA Tech's soil sampling recommendations for fields in no-till production: soil samples should be taken to a depth of 2 to 4".

Soil Test Results: pH

Sample	Range of results for 24 zones		Overall average		
	pH	Zn availability	pH	Zinc (ppm)	Zinc availability
0 to 2"	6.8 to 7.3	54% deficient; 46% sufficient	7.0	1.1	sufficient (but borderline)
0 to 6"	6.4 to 7.1	8% deficient; 92% sufficient	6.7	0.9	sufficient
0 to 12"	6.3 to 6.9	100% sufficient	6.5	0.8	sufficient

As you might expect for a field in long-term no-till, we saw pH stratification, with shallow samples showing higher pH than deeper samples. For all three sampling depths, pH was above VA Tech's recommended level of 6.2. Therefore, VA Tech would have recommended no lime for corn production on this field, no matter what the sampling depth.

If you only look at the average 12" sample, the field's pH looks good. But the shallower samples suggest that the field actually got too much lime. High pH ties up micronutrients, resulting in deficiencies even if micros are present in the soil. At the 0 to 2" depth, more than half of the field's 24 zones tested as zinc deficient due to high pH. Although the average for the whole field at 0 to 2" depth showed zinc to be sufficient, it was on the borderline of deficiency.

The bottom line? In long-term no-till situations, sampling too deep can lead to money wasted on lime as well as micronutrient deficiencies in the most critical part of the root zone.

Soil Test Results: Phosphorus

Sample	Range of results for 24 zones		Overall average	
	P soil test result (lb/A)	VT P_2O_5 rec. (lb/A)	P soil test result (lb/A)	VT P_2O_5 rec. (lb/A)
0 to 2"	24 (M) to 90 (H+)	60 to 20	47 (H-)	40
0 to 6"	21 (M) to 77 (H)	60 to 30	42 (H-)	40
0 to 12"	18 (M-) to 54 (H-)	80 to 40	35 (M+)	40

Phosphorus (P) is similar to lime in that it doesn't move much in the soil. So it's not surprising that we again saw stratification, with the shallow samples generally testing higher in P than deeper samples. For some individual zones, sampling down to 12" resulted in an increase in VA Tech P_2O_5 fertilizer recommendations for corn production. When we look at overall averages for the field, we see that VA Tech would have recommended the same 40 lb/A P_2O_5 fertilizer, no matter what the sampling depth. But deep sampling caused the overall P soil test result to drop one level, from H- to M+. So, deep sampling on this field would eventually result in unnecessarily high P_2O_5 fertilizer recommendations.

The bottom line? In no-till situations, sampling too deep can lead to money wasted on unnecessary P_2O_5 fertilizer.

Soil Test Results: Potassium

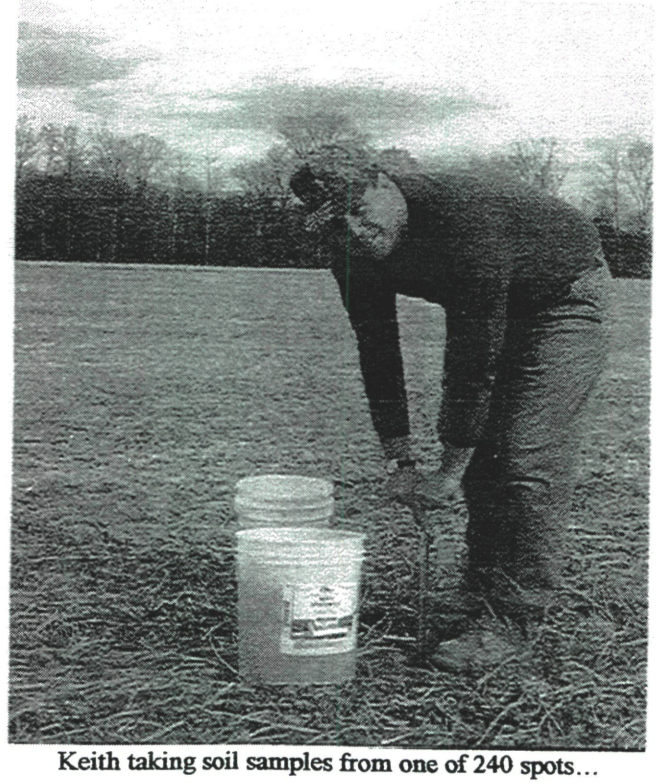
Sample	Range of results for 24 zones		Overall average	
	K soil test result (lb/A)	VT K_2O rec. (lb/A)	K soil test result (lb/A)	VT K_2O rec. (lb/A)
0 to 2"	78 (M-) to 193 (H-)	80 to 40	132 (M)	60
0 to 6"	53 (L) to 148 (M)	100 to 60	101 (M)	60
0 to 12"	37 (L) to 116 (M)	100 to 60	82 (M-)	80

Potassium (K) is more mobile in the soil than lime or P, so we weren't sure what to expect here. In some soil types, deep sampling for K can work to your advantage, because it allows you to detect K that has leached out of the surface and accumulated in a heavier subsoil layer. Deep roots can mine some of that subsoil K. But in this case, sampling down to 12" for K did not pay. We again saw stratification, with the shallow samples generally testing higher in K than deeper samples. When we look at average results for the entire field, we see that sampling down to 12" unnecessarily increased the amount of K_2O fertilizer recommended for our corn crop by 20 lb/A. Assuming a potash cost of $0.15 per pound, that's an unnecessary expense of $3.00 per acre. Note that a sample deeper than 12" that included clayey subsoil might have produced a different result. But sampling 8 to 12" deep usually won't reach that layer.

Take home point: In long-term no-till situations, sampling too deep can sometimes lead to money wasted on unnecessary K_2O fertilizer.

Conclusion

As we move to more and more long-term no-till, we need to be more aware of soil sampling depth. If you're going to till the ground after sampling, you should sample to whatever depth your tillage equipment will mix. But if the soil will not be tilled, VA Tech recommends that samples be taken to a depth of only 2 to 4". This applies to no-till cropland as well as pasture and hayland. **Before you send anyone out to take soil samples, make sure you give clear instructions about sampling depth for each field.** And remember: VA Tech soil testing is free for farm samples.



Keith taking soil samples from one of 240 spots...

Effect of Sidedress N on Corn Land Fertilized in January with Poultry Litter

Cooperators

Producer:	Philip Minor Farms, King & Queen
VA Cooperative Extension:	Chris Lawrence, King & Queen/King William Keith Balderson, Essex

Objective

To see if sidedress application of N to corn land treated with poultry litter in January would significantly increase yield, as suggested by the pre-sidedress nitrate test (PSNT).

Production Practices

Soil types:	Mostly Bojac, some State	
Previous crop:	Full-season soybeans	
Tillage:	No-till. At least 3 years continuous no-till corn/soybeans prior to this plot.	
Hybrid:	Pioneer 33K81	
Planting date:	mid-April, 2001	
Population:	21,000 in 30" rows	
Herbicides:	Preplant: 1.6 qt. Bicep II, 1.5 pt. Princep, 0.75 pt. Atrazine, 0.5 pt. 2,4-D	
Insecticides:	Force in furrow at planting	
Soil test data:	PSNT: 12 ppm	
Litter/fertilizer:	Litter (mid-January):	Approx. 130 N – 180 P_2O_5 – 145 K_2O (3 ton/A)
	In herbicides: (3/28)	25 N
	Sidedressed: (5/25)	
	Litter only strips:	0 N
	Sidedressed strips:	50 N
Harvest date:	September 18, 2001	

Discussion

We set up this plot next to our large study monitoring the effect of early litter application on nitrate leaching (see elsewhere in this publication). Like the leaching study, this plot involved spreading litter about 3 months prior to planting. Virginia guidelines state that poultry litter should be spread no more than 30 days prior to the expected planting date. The concern is that nitrate N in the litter will become available for loss through leaching or runoff.

Yield Results

Treatment	Replication	Moisture at harvest (%)	Yield (bu/A at 15.5% moisture)	Yield Advantage with Sidedress N (bu/A)
Sidedress N	1	16.5	128	+38
Litter only	1	15.9	90	
Sidedress N	2	16.3	113	+21
Litter only	2	15.5	92	
Sidedress N	3	16.0	114	+29
Litter only	3	16.1	84	
Sidedress N	4	16.8	123	+28
Litter only	4	16.7	94	
Averages				
Sidedress N		16.4	119	+29
Litter only		16.0	90	

The yield results show that there was a clear need for sidedress N, even though this field had received about 155 total pounds of first-year available N prior to planting. The pre-sidedress nitrate test (PSNT) result of 12 ppm correctly predicted this need for sidedress N. This is a reminder of how important it is to run the PSNT when using poultry litter ahead of corn.

The results of this plot reinforce a number of other key points made in previous plot reports about managing poultry litter N. The N in litter appears to behave a lot like the N in commercial fertilizer. It is available for plant uptake or loss through leaching or runoff soon after it is applied. Therefore, you should delay spreading litter as long as possible before corn planting to make sure as much litter N as possible is still around during the key silking and tasseling period. Another good reason for delaying litter applications is to comply with the state's 30-day guideline described above.

This particular plot may represent a worst-case scenario with regard to leaching or runoff losses of poultry litter N. Much of this plot was located on very light land prone to leaching. Furthermore, 4.5 inches of rainfall fell on this site on June 1. A rainfall event of that intensity is extremely rare. That exceptional storm probably washed an exceptional amount of nitrate N out of the root zone just prior to the crop's key uptake period. But even on heavier ground in normal years, applying litter this far ahead of planting is not advisable if you want to maximize the material's N value.

Combined Analysis of 20 Deep Ripping Plots, 1997 – 2001

Chris Lawrence, Keith Balderson, Paul Davis, David Moore

Last year, we showed you combined results from 18 replicated deep ripping plots that we conducted over multiple years. We have 2 plots to add for this year, bringing our total to 20.

All 20 of these deep ripping plots involved subsoiling with a DMI tool or similar implement that fractures the soil at depth but causes minimal surface disturbance. This subsoiling was the only tillage conducted on all 20 plots. Note that our plots involving other deep tillage implements like the Paratill tool or strip-till implements are not included in this combined analysis.

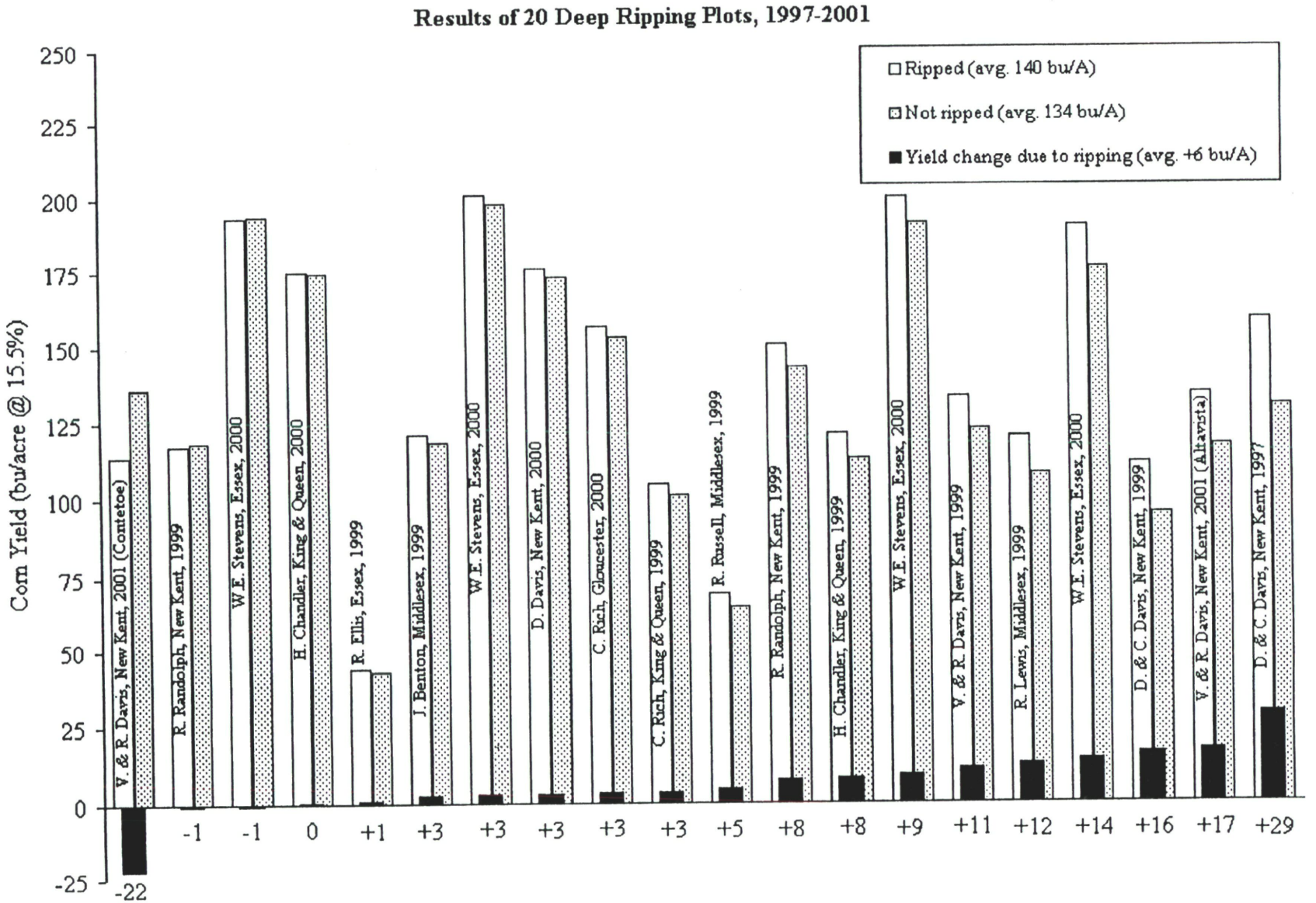
The combined results of our 20 deep ripping plots are shown in the chart on the following page. The main cooperator's name, the county in which the plot was located, and the year are listed for each plot. Yield is represented by the height of the bars. For each plot, the difference between the average ripped yield (white bar) and the average no-till yield (gray bar) is represented by a black bar and a number. If ripping increased yield, the black bar goes up and the number is positive. If ripping decreased yield, the black bar goes down and the number is negative.

It should be emphasized that these 20 plots represented a wide variety of field situations, soil types, ripping techniques, etc. For example, cooperators usually selected sites for the plots. Agents neither sought out nor avoided especially compacted fields for plots. Overall, we believe that these plots are fairly representative of the wide range of situations that a local producer is likely to encounter when ripping a significant number of acres over a number of years.

In 16 of the 20 plots, there was at least a small yield increase with ripping. But did ripping increase yield enough to pay for owning and operating a ripper, plus provide for some profit? As the chart shows, the average yield increase with ripping across 20 plots was 6 bushels per acre. Ripping costs will vary from one farm to another. However, we still believe that a yield increase of 6 bushels per acre from ripping is **at best a breakeven situation for most growers**.

What about the 4 plots in which ripping did not increase yield? In 3 of those 4 plots, ripping had essentially no effect (yield changes of 0 or -1 bu/A). But in the plot from 2001 (V. & R. Davis, New Kent, 2001 (Conetoe loamy sand)), ripping produced a 22 bushel per acre yield **decrease**. We had heard about cases of ripping hurting yield, but this was the first time we actually documented it in a plot. This plot was replicated 6 times, so we feel pretty confident about the results. A second plot at the same site (but on a very different soil type) produced a 17 bushel per acre yield **increase** (V. & R. Davis, New Kent, 2001 (Altavista fine sandy loam)). These plots confirm what we have been saying all along: soil type really matters when it comes to ripping. Look for details about this interesting plot elsewhere in this book.

What's the bottom line? The key to making money on subsoiling is to only run the ripper when you are likely to get a strong yield response. How do you identify those situations? Scouting your fields for compaction with a penetrometer or simple probe is a good start. However, some researchers suggest that how much a soil layer resists penetration with a probe in March may not have much to do with how much it limits root growth in July. We believe a combination of


Results of 20 Deep Ripping Plots, 1997-2001
Ripped (avg. 140 bu/A)
Not ripped (avg. 134 bu/A)
Yield change due to ripping (avg. +6 bu/A)
Corn Yield (bu/acre @ 15.5%)
250
225
200
175
150
125
100
75
50
25
0
-25
V. & R. Davis, New Kent, 2001 (Contetoe)
R. Randolph, New Kent, 1999
W.E. Stevens, Essex, 2000
H. Chandler, King & Queen, 2000
R. Ellis, Essex, 1999
J. Benton, Middlesex, 1999
W.E. Stevens, Essex, 2000
D. Davis, New Kent, 2000
C. Rich, Gloucester, 2000
C. Rich, King & Queen, 1999
R. Russell, Middlesex, 1999
R. Randolph, New Kent, 1999
H. Chandler, King & Queen, 1999
W.E. Stevens, Essex, 2000
V. & R. Davis, New Kent, 1999
R. Lewis, Middlesex, 1999
W.E. Stevens, Essex, 2000
D. & C. Davis, New Kent, 1999
V. & R. Davis, New Kent, 2001 (Altavista)
D. & C. Davis, New Kent, 1997
-22
-1
-1
0
+1
+3
+3
+3
+3
+3
+5
+8
+8
+9
+11
+12
+14
+16
+17
+29

factors must be considered when trying to predict how a particular field will respond to ripping. These factors can be grouped into the following 3 categories:

1. History of the field – amount and type of traffic, degree of compaction, etc.
2. Soil type – tendency to compact, presence of water-holding soil layer below compaction zone, etc.
3. Ripping technique – timing of ripping, placement of seed in relation to ripper track, etc.

If you want help making a decision on whether or not to rip a particular field, give one of us a call. We don't have all the answers yet, but these plots have taught us a few things. For everyone else pulling a ripper, we still stand behind the following advice:

1. Know how much it costs to own and run **your** ripper.
2. Set up plots with us or on your own to see what ripping is doing for **your** yields.
3. Calculate whether ripping is helping or hurting **your** bottom line.

Nine-row ripper at work in King & Queen County

Biosolid Tillage Study on Corn
Davis Farm, New Kent

Producers: Ray & Vin Davis
Cooperators: Jamie Rittenhouse, Synagro; Brian Noyes & Jim Wallace, Colonial SWCD: Paul Davis, VCE-New Kent
Biosolids Applied: February 28, 2001
Tillage: No-Till
No-Till then ripped on March 28, 2001
Chisel plowed on March 3, 2001
Soil Types: Field #1 Conetoe (loamy sandy); Field # 2 Altavista (fine sandy loam)
Hybrid: Pioneer 33K81
Plant Population Dropped: 25,000
Planting Date: 5 April 2001
Fertilizer: 100 # Potash preplant; 40# Nitrogen sidedress
Herbicides: 1.8 qt. Bicep + 1.5 pts. Bladex + 1 qt. Roundup Ultra
Insecticide: Kernel Guard & 2 oz. Warrior broadcast preplant
Harvested: September 4, 2001

Field #1 Conetoe (Sandy soil with low water holding compacity)

	Treatment	Yield (bu/Ac)	% Moisture
Rep 1	Tilled	100.2	18.1
	No-Till	133.0	21.4
	No-Till Ripped	112.2	21.4
Rep 2	Tilled	93.0	16.7
	No-Till	152.3	23.0
	No-Till Ripped	110.6	22.4
Rep 3	Tilled	102.5	19.7
	No-Till	156.3	20.4
	No-Till Ripped	105.4	22.1
Rep 4	Tilled	109.5	16.4
	No-Till	130.0	21.5
	No-Till Ripped	138.3	21.7
Rep 5	Tilled	97.5	18.3
	No-Till	128.6	21.0
	No-Till Ripped	110.3	20.5
Rep 6	Tilled	89.4	16.7
	No-Till	114.4	21.5
	No-Till Ripped	107.9	20.0

		Yield	Moisture	Final Population
AVG	Tilled	98.7 bu/Ac	17.6%	23,600
	No-Till	135.8 bu/Ac	21.5%	23,000
	No-Till Ripped	114.1 bu/Ac	21.3%	21,500

Field # 2 Altavista (Medium water holding compacity soil)

	Treatment	Yield (bu/Ac)	% Moisture
Rep 1	Tilled	73.1	19.7
	No-Till	131.0	22.4
	No-Till Ripped	118.8	24.0
Rep 2	Tilled	89.4	19.0
	No-Till	122.2	22.4
	No-Till Ripped	150.6	23.7
Rep 3	Tilled	107.2	20.9
	No-Till	119.1	19.5
	No-Till Ripped	124.4	21.5
Rep 4	Tilled	117.5	20.2
	No-Till	106.0	21.8
	No-Till Ripped	151.6	23.2
Rep 5	Tilled	121.4	19.0
	No-Till	112.9	21.0
	No-Till Ripped	130.5	20.4
Rep 6	Tilled	109.4	18.5
	No-Till	112.8	21.0
	No-Till Ripped	128.4	20.3

		Yield	Moisture	Final Population
AVG	Tilled	103.0 bu/Ac	19.5	22,300
	No-Till	117.3 bu/Ac	21.4	22,800
	No-Till Ripped	134.1 bu/Ac	22.2	23,000

Discussion: The tilled treatments at both sites underwent severe drought stress in July (June 17-July 23 on 0.65 inches rain) while the no-till treatment showed stress but 7-10 days later than the tilled treatment plots. From past studies looking at ripping for No-Till corn we have seen no benefit to ripping the sandy soil types i.e., Bojac and Conetoe (sand 18" +) because there is not enough water holding capacity in these soils even down 5 feet. By ripping just prior to planting opened the soil to allow the water to move down more rapidly thus becoming less available to the corn plant. On the heavier, Altavista soil, the yields were what we expected following the heavy equipment used to spread the biosolids and under moderate drought conditions. Ripping this heavier soil increased yields by 17 bu/A over the No-Till and 31 bu/A over the tilled plot. Biosolids and continuous No-Till grain production can work together.

There are problems of odor and soil compaction which can be addressed with field selection, soil types and time of year biosolids are applied.

The benefits of biosolids probably do not outweigh the benefits of your soils quality after 5 continuous years of No-Tilled grain production. Biosolids and continuous No-Till can work together, but they may not depending on your fields location to highly populated communities.

Cohoke Farm Strip-Rip Test

Cooperators

Producer: Cohoke Farms, King William

VA Cooperative Extension: Chris Lawrence, King William
Paul Davis, New Kent

Production Practices

Hybrid: Garst 8288
Planting date: April 24, 2001
Tillage: No-till vs strip-till (see below)
Herbicides: Aatrex, Bicep
Insecticides: Force in-furrow
Soil type: Kempsville sandy loam

Previous crop: Wheat/double-crop soybeans

Fertilizer (lb/A):
Broadcast: 20-20-60-12S
Starter: 40-15-0
Sidedress: 40 N
Harvest date: September 8, 2001

Results & Discussion.

Yield Results

Treatment	Moisture (%)	Yield (bu/A at 15.5%)
No-Till 1	23.0	141
Ripped 1	23.2	132
Ripped 2	21.7	143
No-Till 2	22.5	145
Averages		
No-Till	22.8	143
Ripped	22.5	137

In this test, Hugh Johnson strip-ripped under 12 rows prior to planting corn. The rest of the field was planted no-till. Hugh made this ripper himself to strip-till ahead of cotton. The implement rips about 10 inches down and conventionally tills a narrow strip right above the rip. Cotton or corn are then planted into the tilled strips directly above the rip.

We harvested six rows at a time, giving us 2 comparisons between ripped rows and adjacent no-till rows. Across these 24 rows, the corn planted in the conventional strips above the rips yielded 6 bushels per acre less grain. Hugh indicated soil conditions were wet at the time he did the strip-ripping as well as at planting. In addition, this field was ripped after sludge a few years before this test. These factors might help explain the results we obtained.

Combined Analysis of Gaucho Insecticide Seed Treatment Plots, 2001

Chris Lawrence, Keith Balderson, Paul Davis, David Moore

Introduction

This year, our team of Extension Agents harvested 5 different plots involving the new corn seed treatment Gaucho. The results of these plots are presented individually elsewhere in this publication. Sometimes it is difficult to see overall trends when looking at the results of related plots individually. This report looks at the combined results of all of our Gaucho plots. We've also included the results of a plot involving Gaucho from the 2001 Ag Expo at Brandon Plantation in our combined analysis. The results of the Ag Expo plot are not written up separately elsewhere in this publication.

None of our different seed treatment plots involving Gaucho were designed in exactly the same way. The one thing they had in common is that they compared the new Gaucho seed treatment to at least one lower-cost check treatment over a minimum of 3 replications. The checks in the tests were Kernel Guard or no insecticide treatment (either on the seed or in furrow) at planting. The two key questions we want to answer by looking at the combined plot results are:

1. If I've been using Kernel Guard only at planting, is it worth upgrading to Gaucho?
2. If I've been using no insecticide treatment at planting, is it worth upgrading to Gaucho?

Explanation of Chart

The combined results of the 6 Gaucho plots are shown in the chart on the following page. Yield in bushels per acre is represented by the height of the bars. The groups of bars on the left look at 4 comparisons of Gaucho vs. Kernel Guard. The groups of bars on the right look at 4 comparisons of Gaucho vs. no treatment. There are a total of 8 comparisons from 6 plots, because some plots made more than one comparison. We've presented the results for each replication separately, to give you a better look at the consistency of Gaucho's performance across the trials. A total of 27 replications are shown for the 8 comparisons.

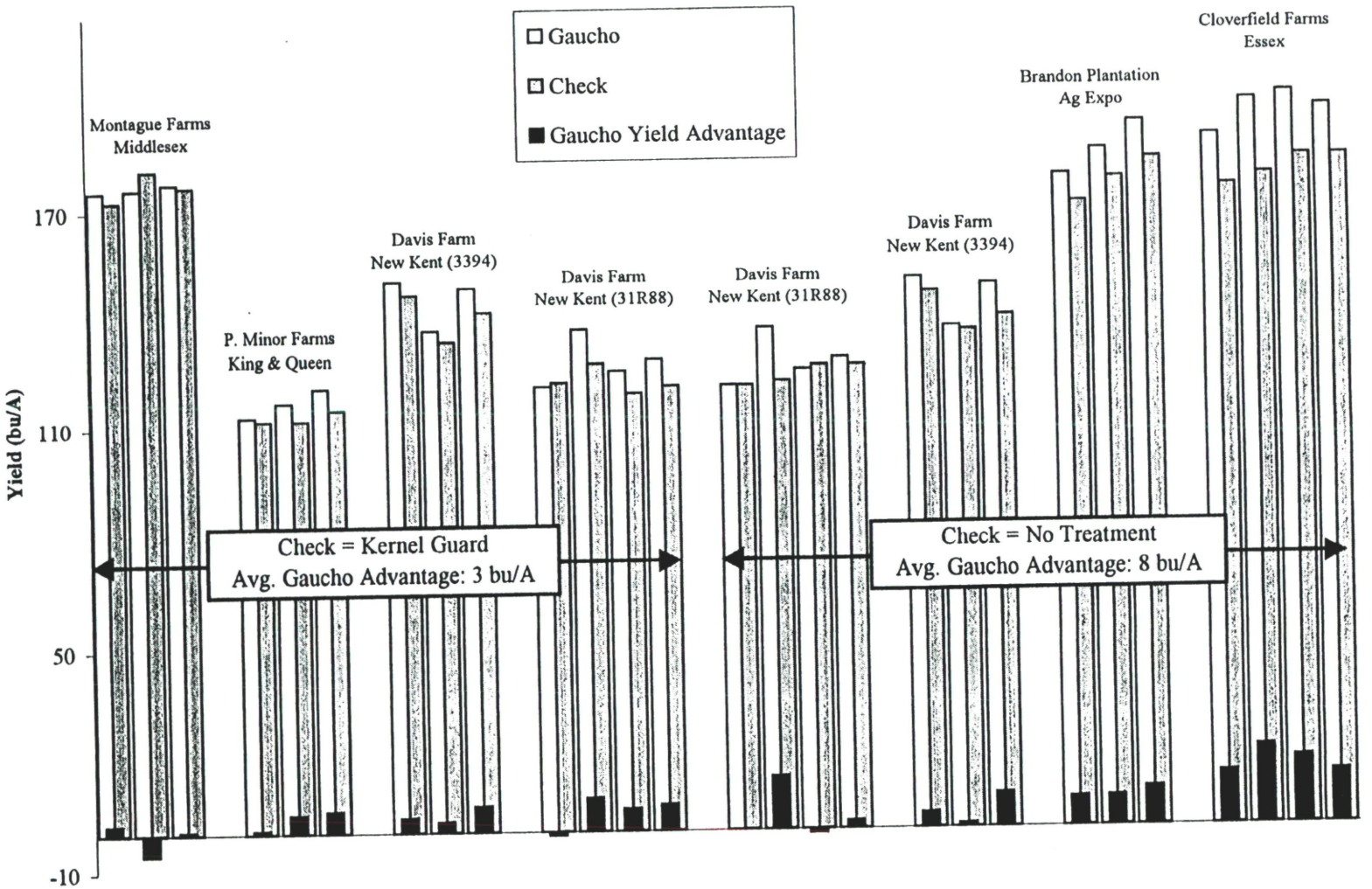
For each replication, the yield difference between the Gaucho (white bar) and the check treatment (gray bar) is represented by a black bar. If Gaucho yielded more than the check, the black bar is positive (goes up). If Gaucho yielded less, the black bar is negative (goes down).

Gaucho vs. Kernel Guard

Combined Analysis of 4 Gaucho vs. Kernel Guard Comparisons

Treatment	Yield (bu/A at 15.5% moisture)	Yield Advantage with Gaucho (bu/A at 15.5%)
Gaucho	140	+3
Kernel Guard	137	

2001 Corn Seed Treatment Plot Results: Gaucho vs. Kernel Guard/No Treatment



In 11 out of 13 replications from 4 different plots, Gaucho yielded at least a little better than Kernel Guard. Gaucho's overall yield advantage averaged out to about 3 bushels per acre. Assuming a value per bushel of $2.11 (the King & Queen loan rate for corn), that's an increase in revenue of about $6.33 with Gaucho. We'll assume the Gaucho seed treatment costs about $3 per acre and the Kernel Guard seed treatment costs about $1 per acre. So there's an increase in cost of about $2 per acre with Gaucho. The bottom line? Across these 4 plots, upgrading to Gaucho from Kernel Guard produced an overall profit of **$4.33** per acre ($6.33 added revenue - $2.00 added cost = $4.33 overall profit).

Gaucho vs. No Treatment

Combined Analysis of 4 Gaucho vs. No Treatment Comparisons

Treatment	Yield (bu/A at 15.5% moisture)	Yield Advantage with Gaucho (bu/A at 15.5%)
Gaucho	163	+8
No Treatment	155	

In 12 out of 14 replications from 4 different plots, Gaucho yielded at least a little better than no insecticide treatment at all. Gaucho's overall yield advantage averaged out to about 8 bushels per acre over no treatment. Assuming again a value per bushel of $2.11, that's an increase in revenue of about $16.88 with Gaucho. Assume again that the Gaucho seed treatment costs about $3 per acre. So there's an increase in cost of about $3 per acre with Gaucho over no treatment. The bottom line? Across 4 plots, upgrading to Gaucho from Kernel Guard produced an overall profit of **$13.88** per acre ($16.88 added revenue - $3.00 added cost = $13.88 overall profit).

If you average out Gaucho's yield advantage over both types of checks, Gaucho produced an average yield gain of about 6 bushels per acre. However, this is probably the least useful of the numbers to look at if you're trying to make a decision on whether to try Gaucho, since you are probably upgrading from either Kernel Guard or no insecticide, but not a combination of the two.

Conclusions

Obviously, the results of our work with Gaucho look promising. Whether you are upgrading from Kernel Guard or from no insecticide treatment at planting, our analysis suggests Gaucho is definitely worth a look. We will do more plotwork evaluating Gaucho on corn next year.

You may be wondering whether these 6 Gaucho plots were representative of typical fields or whether they had especially bad soil insect infestations. There was heavy soil insect pressure in a few plots. But we did not all search for infested fields in which to set up these plots. Hopefully, that means these Gaucho results are representative of what you might expect to see in an average field in another year.

Gaucho must be applied to the seed before it ever gets in the bag. If you are interested in the product, call your seed supplier immediately. Also, be aware that new seed coatings like Gaucho may affect planter operation, metering, or wear (particularly on finger-pickup units).

New Kent Corn Seed Insecticide Study
Pamunkey Farms, New Kent

Producer:	Stanley, David & John Hula, Renwood Farms
Cooperators:	Daryl Clay, Pioneer Seed; Ted Kabot, Gary Dollarhite, and Berry Lewis, Gustafson; Lee Wooten, Renwood Farms; Paul Davis, New Kent Extension
Planting Date:	April 23, 2001
Tillage:	No-Till
Population:	Pioneer 34K77 @ 24,000; Pioneer 31R88 @ 28,500
Soil Type:	Pamunkey and Tetotum sandy loams
Fertilizers:	Starter 65-34-0 + 1 Zn + .2 B
	Broadcast 80 lbs potash
	Sidedress 110# N
Herbicides:	Preplant 1.5 pt. Gramoxone Extra + 2 pt. Bladex
	Preemergence 3 pt. Atrazine + 3 pt. Princep
Harvest Date:	9/26/01

Insecticide Seed Treatments

Pioneer 3394

	---- bu /A ----					Final
	Rep 1	Rep 2	Rep 3	Rep 4	Avg bu/A & % Moisture	Stand Count
Prescribe	157	143	146		148.7 @ 18.8%	23,800
Gaucho	150	136	148		144.7 @ 18.8%	23,000
Kernel Guard	146	133	141		140.0 @ 18.8%	22,600
Untreated	146	135	139		140.0 @ 18.9%	19,700

Pioneer 31R88

	----	bu/A	----		
Prescribe	135	133	135	135	134.5 @ 25.2%	28,100
Gaucho	121	136	125	128	127.5 @ 25.7%	27,000
Kernel Guard	122	127	119	121	122.2 @ 25.5%	27,100
Untreated	121	122	126	126	123.8 @ 24.8%	25,600

Pioneer 31R88

	----	tons/A Silage	----	Average	
Prescribe	22.6	22.6	22.6	20.9	22.2 tons	28,100
Gaucho	18.7	22.6	21.8	17.0	20.0 tons	27,000
Kernel Guard	22.2	19.2	20.0	18.3	19.9 tons	27,100
Untreated	20.5	20.9	16.6	18.7	19.2 tons	25,000

Discussion: This corn was under severe drought stress from late June thru July (.65 inches rain between June 19 and July 22). Under better moisture conditions we would expect a larger yield difference with the high stand count treatments, Prescribe @23,800 and Gaucho @23,000. Gaucho and Prescribe are the same ingredient (Imidacloprid). Gaucho is at .16 active ingredient and Prescribe @1.34 mg active ingredient per kernel. This field had above threshold levels of white grubs > 2 grubs per square foot. White groups caused significant damage to seed kernels and new sprouts and roots of the untreated seeds which showed up in the final stand counts by reducing the stands by 3,000-4,000 stalks/ac. Both Prescribe and Gaucho seemed to reduce grub damage but farmers need to realize that grubs are not on the Gaucho label, only on Prescribe. It will cost an additional $10.50/bag to have Gaucho treated seed, but ordering early and prepaying can bring the cost down to $7.85/bag which is less than $2.50/acre. Compare these products with your standard kernel Guard type products and your historic insect pressure problems before making your management decision. See Middlesex, King William and Essex seed treatment plots and compare results.

EVALUATION OF CORN SEED TREATMENTS

Cooperators:	Producer: Cloverfield Farms,Inc. Extension: Keith Balderson, VCE, Essex Berry Lewis, Gustafson
Hybrid:	Pioneer 3394
Previous Crop:	Double Crop Soybeans
Soil Type:	Kempsville sandy loam
Fertilization:	Starter: 40 pounds per acre of nitrogen and 5 pounds of sulfur per a acre Broadcast: 12-30-100 Sidedress: 90-0-0-11
Planting Date:	April 5, 2001
Seedbed Preparation:	No-till
Herbicides:	1 gallon per acre Fieldmaster 1 pt. per acre Princep 1 pt. per acre atrazine
Insecticides:	Gaucho, Prescribe, or nothing
Date Harvested:	August 27, 2001

Treatment	Rep.	Moisture	Yield @ 15.5%
Gaucho	1	30.3	189
Check (No Treatment)	1	30.8	175
Prescribe	1	29.7	188
Prescribe	2	29.4	194
Check	2	32.2	178
Gaucho	2	30.3	199
Gaucho	3	30.3	201
Check	3	31.2	183
Prescribe	3	30.6	195
Prescribe	4	31.6	192
Check	4	30.8	183
Gaucho	4	31.2	197

Averages:

Treatment	Moisture	Yield @ 15.5%
Gaucho	30.5	197a*
Check	31.3	180b
Prescribe	30.3	192a

*Means with the same letter are not significantly different at P=0.05, DMRT.

Discussion:

The moistures are high in this plot because the field around the plot was planted in 95 day corn, and the grower could not justify coming back to the farm to harvest the plot at a later date. Gaucho and Prescribe contain the same active ingredient (Imidacloprid). Gaucho is applied at .16 mg active ingredient per kernel and Prescribe is applied at 1.34 mg active ingredient per kernel. In this plot, the primary insect was white grubs. Prior to planting the population was estimated at 1.5 grubs per square foot. The current economic threshold for grubs is 1-2 grubs per square foot. Although no plant stand counts were taken, it is estimated that grub feeding in the check plots reduced the plant stand by 500 to 1,000 plants per acre. The check plots were obvious about one month after planting. Some plants were stunted and some were killed. There was little visual difference in the Gaucho and Prescribe plots. Both seemed to be effective on the grubs. Farmers should realize that white grub control is not on the Gaucho label, but it is on the Prescribe label. Gaucho will cost about $3-4 per acre, and Prescribe will be comparable in cost to the in-furrow insecticides used in corn. Gaucho should eliminate the need for the use of a seed treatment such as Kernel Guard. Growers with fields with a history of light to moderate grub infestations are encouraged to try Gaucho on some fields. Fields that are heavily infested with white grubs should be planted with Prescribe treated seed or an in-furrow insecticide should be used.

Corn Seed Treatment Plot

Cooperators:
Producer: Montague Farms, David Taliaferro
Extension: David Moore, VCE Middlesex
Donna Tuckey, IPM Agent
Agribusiness: Gary Dollarhite, Gustafson
Berry Lewis, Gustafson

Previous Crop: Soybeans

Soil Type: Kempsville Sandy Loam

Planting Date: April 27, 2001

Land Preparation: No-till in 36-inch rows

Fertilization:
0-0-60 pre-plant
100-60-0 pre-plant as Pelleted Sludge
50-0-0 as starter
100-0-0 after pre-sidedress N testing showed < 11 ppm

Crop Protection:
1.3 qt. Gramoxone, 1.5 qt. Atrazine,
2.4 pt. Prowl, 1 qt. Bladex

Harvest Date: September 18, 2001

Treatment	Rep.	Moisture	Yield @ 15.5%
Check(Kernal Guard)	1	15.6%	178.4 bushels
No Treatment	1	15.4	173.7
Check	2	16.0	172.9
No Treatment	2	15.9	167.4
Check	3	15.8	165.8
No Treatment	3	15.8	170.0
Average Check		15.8	172.4
Average No Treatment		15.7	170.4
Check	1	15.9	172.9
Gaucho	1	15.9	175.5
Check	2	16.1	181.4
Gaucho	2	15.8	176.1

Check	3	15.7	176.7
Gaucho	3	15.6	177.6
Average Check		15.9	177.0
Average Gaucho		15.8	176.4
Check	1	15.9	179.6
Prescribe	1	16.0	183.9
Check	2	16.0	181.6
Prescribe	2	16.5	184.3
Check	3	16.5	185.1
Prescribe	3	16.0	186.2
Average Check		16.1	182.1
Average Prescribe		16.2	184.8

Average Stand Counts taken 2-3 weeks after planting:

Check (19,399) vs. No Treatment (20,500)

Check (20,800) vs. Gaucho (23,300)

Check (23,000) vs. Prescribe (23,500)

*In test, "check" means seed were treated with Kernel Guard and "no treatment," means NO TREATMENT.

Discussion:

Gaucho and Prescribe, products of Gustafson, contain active ingredient *Imidacloprid.* Gaucho was applied to corn seed at .16 mg active ingredient per kernel and Prescribe was applied at the 1.34 mg per kernel rate. White grubs have been a pest for some growers in the area. In this plot, pre-plant scouting found 1-1.5 grubs per square foot of soil. The economic threshold is 1-2 grubs. Stand counts indicate an advantage to Gaucho seed treatment and a slight Prescribe advantage over Gaucho.

Gaucho will cost about $3.50 per acre to treat seed. Prescribe is comparable, price-wise, to in-furrow soil insecticides. Kernel Guard, the treatment of choice for most producers is about $2.00 per acre. Yields in this plot tend to show little advantage to the use of these treatments except for the safety of not having to breathe the "purple stuff". It is your decision how much that is worth to you.

Gaucho is not labeled for white grubs, Prescribe is. Producers having light to moderate infestations of grubs are encouraged to look into the use of Gaucho on some fields. Make contact with seed dealers early.

Philip Minor Farms Corn Insecticide Seed Treatment Comparison

Cooperators

Producer:	Philip Minor Farms, King & Queen
VA Cooperative Extension:	Chris Lawrence, King & Queen/King William Keith Balderson, Essex Paul Davis, New Kent
Agribusiness:	Gustafson, Inc. Pioneer Hi-Bred

Production Practices

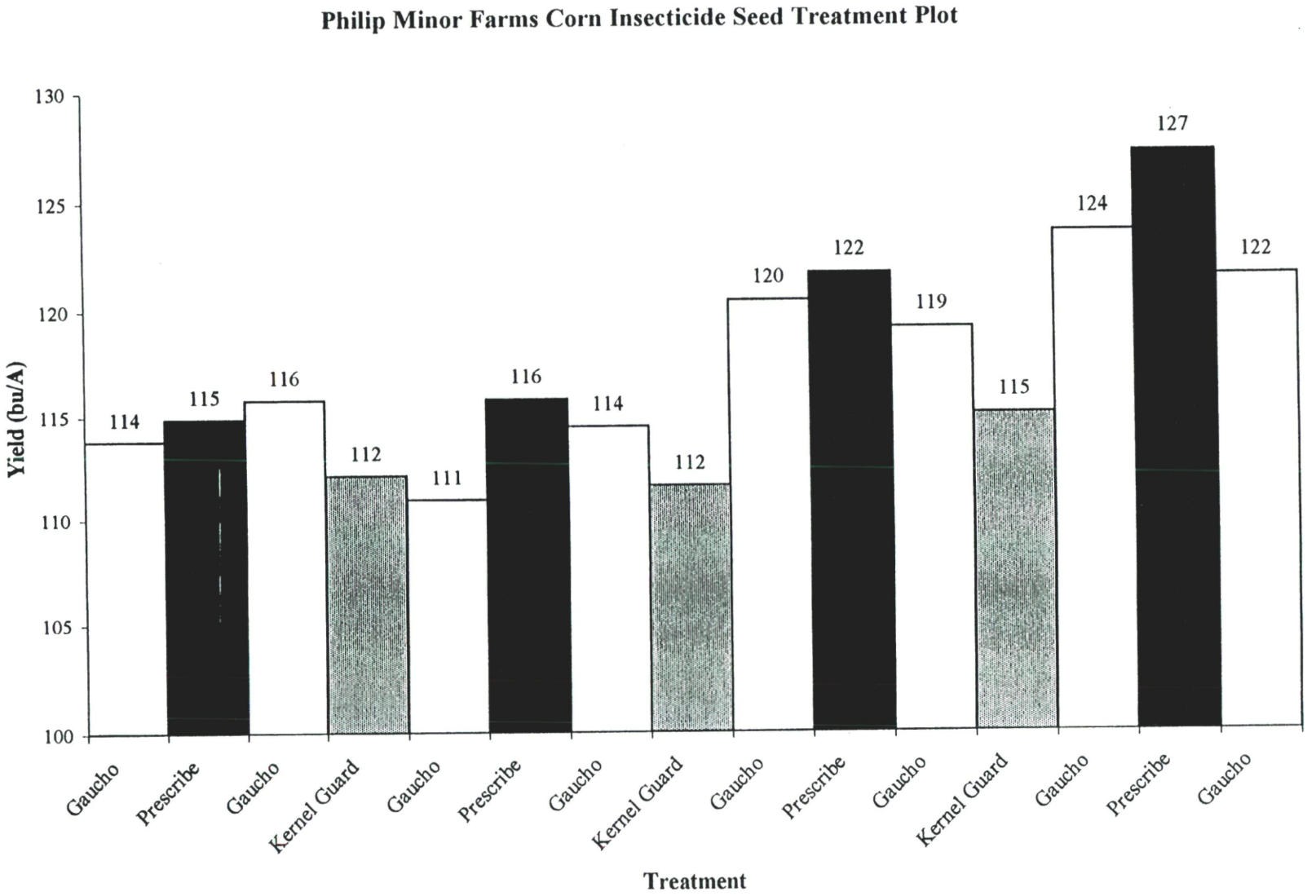
Soil types:	Bojac and Tetotum
Previous crop:	Full-season soybeans
Tillage:	No-till. At least 3 years continuous no-till corn/soybeans prior to this plot.
Hybrid:	Pioneer 3394
Planting date:	April 10 and 12, 2001
Population:	17,000 in 30" rows (see discussion)
Herbicides:	Preplant: 1.6 qt. Bicep II, 1.5 pt. Princep, 0.75 pt. Atrazine, 0.5 pt. 2,4-D
Insecticides:	Prescribe, Gaucho, Kernel Guard (see discussion)
Litter/fertilizer:	Litter (mid-January): Approx. 130 N – 180 P_2O_5 – 145 K_2O (3 ton/A) In herbicides: (3/28) 25 N Sidedressed: (5/25) 50 N
Harvest date:	September 18, 2001

Results

In this plot, we split a 12-row planter 3 ways to compare Kernel Guard, Gaucho, and Prescribe seed treatments. The complete yield results are shown in the chart on the following page; overall averages are below.

Overall Plot Averages

Treatment	Moisture	Yield (bu/A at 15.5%)
Kernel Guard	15.7	113
Gaucho	15.7	117
Prescribe	15.8	120


Philip Minor Farms Corn Insecticide Seed Treatment Plot
Yield (bu/A)
130
125
120
115
110
105
100
114
115
116
112
111
116
114
112
120
122
119
115
124
127
122
Gaucho
Prescribe
Gaucho
Kernel Guard
Gaucho
Prescribe
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Prescribe
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Treatment

Discussion

Kernel Guard is the widely-used hopper box treatment costing about $1 per acre. Gaucho is a new treatment costing about $3 per acre that is being marketed as a substitute for Kernel Guard. On this field, upgrading from Kernel Guard to Gaucho would have cost us $2 per acre and would have increased yields by 4 bu/A. Assuming a corn value of $2.11/bu (King & Queen loan rate), upgrading to Gaucho on this field would have produced **a profit of $6.44 per acre**.

Prescribe uses the same active ingredient as Gaucho, but at a much higher rate. Prescribe is supposed to be comparable in performance and price to an in-furrow insecticide like Force. For purposes of this analysis, we'll assume Prescribe costs roughly $15 per acre. On this field, upgrading from Gaucho to Prescribe would have cost us an extra $12 per acre and would have increased yields by 3 bu/A. At $2.11/bu, upgrading from Gaucho to Prescribe on this field would have produced **a net loss of $5.67 per acre**.

Apparently, there wasn't enough soil insect pressure in this field for Prescribe to pay off. This is not surprising, because we scouted for white grubs prior to planting and found they did not exceed VA Tech thresholds. Note that we had a serious stand reduction after emergence due to cutworms. We observed no difference in the number of cut plants between areas planted with Prescribe and the other materials. This is a reminder that top-dollar insecticides below the soil surface won't necessarily stop cutworms at work above ground.

Gaucho has shown promise in our plots this year (see the combined analysis elsewhere in this publication). Remember that Gaucho and Prescribe must be applied to seed by your supplier. So if you are interested in trying Gaucho, call your salesman immediately.

Also, if you want to set up a plot with these seed treatments on your farm next year, call your Agent. For these plots, we used custom-treated seed from the same lot. This is the best way to ensure your plot is comparing insecticide performance, not differences related to the seed itself.

Combined Analysis of Prescribe Seed Treatment Plots, 2001

Chris Lawrence, Keith Balderson, Paul Davis, David Moore

Introduction

This year, our team of Extension Agents harvested 5 different plots involving Prescribe, the new corn seed insecticide treatment. The seed treatments Prescribe and Gaucho contain identical active ingredients. The difference is that Prescribe contains a much higher concentration of that active ingredient (about eight times greater than Gaucho). So Prescribe provides more insect protection than does Gaucho. Prescribe is also more expensive than Gaucho.

The results of our 5 Prescribe plots are presented individually elsewhere in this publication. Sometimes it is difficult to see overall trends when looking at the results of related plots individually. This report analyzes the combined results of all of our Prescribe plots.

None of our different Prescribe seed treatment plots were designed in exactly the same way. The one thing they had in common is that they compared the new Prescribe seed treatment to at least one lower-cost check treatment over a minimum of 3 replications. The checks in the tests were one or more of the following: Gaucho, Kernel Guard, or no insecticide treatment (either on the seed or in furrow) at planting. The three key questions we want to answer by looking at the combined Prescribe plot results are:

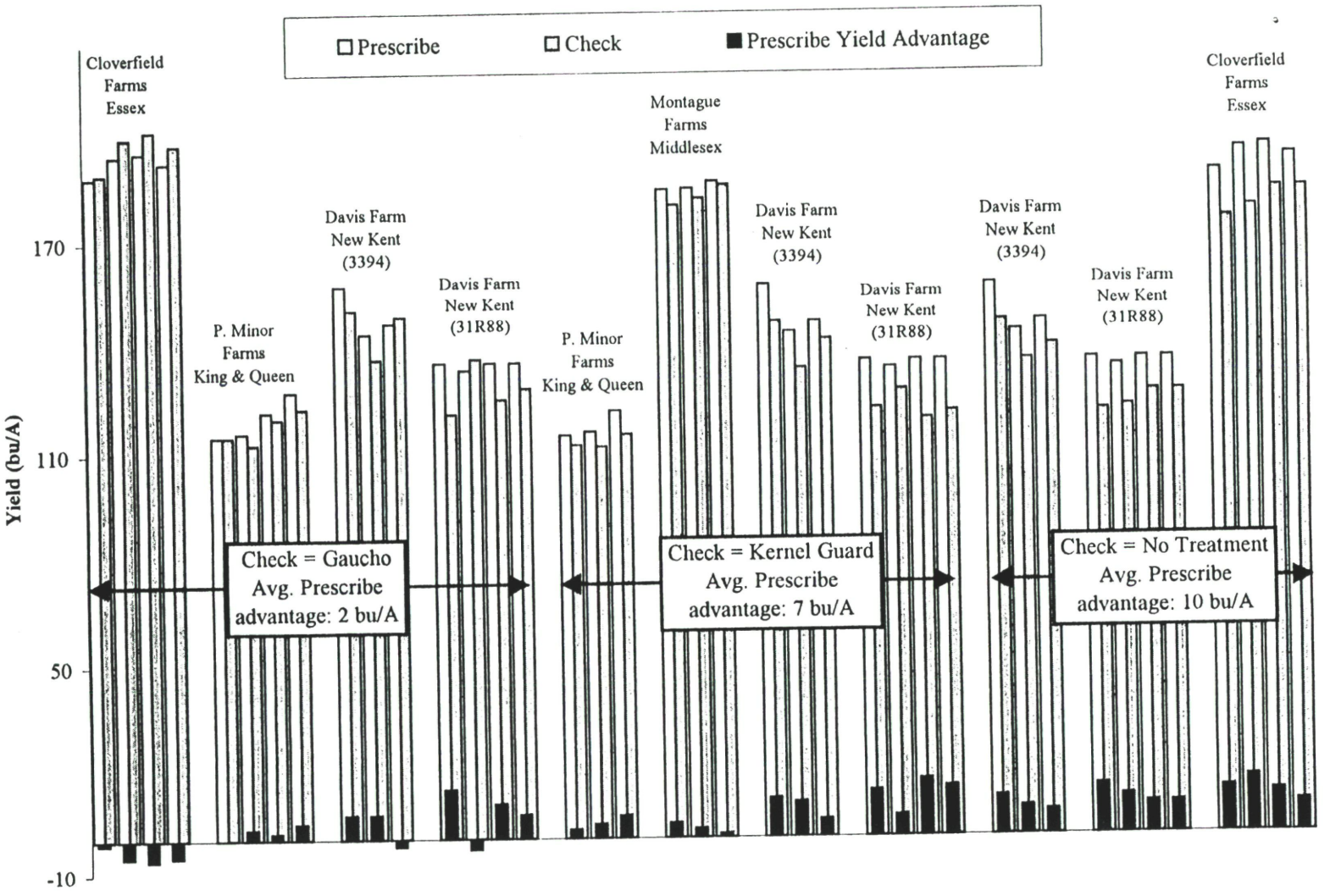
1. If I've been using Gaucho only at planting, is it worth upgrading to Prescribe?
2. If I've been using Kernel Guard only at planting, is it worth upgrading to Prescribe?
3. If I've been using no insecticide treatment at planting, is it worth upgrading to Prescribe?

Explanation of Chart

The combined results of the 5 Prescribe plots are shown in the chart on the following page. Yield in bushels per acre is represented by the height of the bars. The groups of bars on the left look at 4 comparisons of Prescribe vs. Gaucho. The groups of bars in the middle look at 4 comparisons of Prescribe vs. Kernel Guard. The groups of bars on the right look at 3 comparisons of Prescribe vs. no insecticide treatment. There are a total of 11 comparisons from 5 plots, because most plots made more than one comparison. We've presented the results for each replication separately, to give you a better look at the consistency of Prescribe's performance across the trials. A total of 39 replications are shown for the 11 comparisons.

For each replication, the yield difference between the Prescribe (white bar) and the check treatment (gray bar) is represented by a black bar. If Prescribe yielded more than the check, the black bar is positive (goes up). If Prescibe yielded less, the black bar is negative (goes down).

2001 Corn Seed Treatment Plot Results: Prescribe vs. Gaucho/Kernel Guard/No Treatment



Prescribe vs. Gaucho

Combined Analysis of 4 Prescribe vs. Gaucho Comparisons

Treatment	Yield (bu/A at 15.5% moisture)	Yield Advantage with Prescribe (bu/A at 15.5%)
Prescribe	149	+2
Gaucho	147	

In 8 out of 15 replications from 4 different plots, Prescribe yielded at least a little better than Gaucho. Prescribe's overall yield advantage averaged out to about 2 bushels per acre. Assuming a value per bushel of $2.11 (the King & Queen loan rate for corn), that's an increase in revenue of about $4.22 with Prescribe. We'll assume the Prescribe seed treatment costs about $15 per acre and the Gaucho seed treatment costs about $3 per acre (check with your supplier for more details on cost). So there's an increase in cost of about $12 per acre with Prescribe. The bottom line? Across 4 different plots, upgrading to Prescribe from Gaucho produced an overall **loss of $7.78** per acre ($4.22 added revenue - $12.00 added cost = $7.78 loss).

Prescribe vs. Kernel Guard

Combined Analysis of 4 Prescribe vs. Kernel Guard Comparisons

Treatment	Yield (bu/A at 15.5% moisture)	Yield Advantage with Prescribe (bu/A at 15.5%)
Prescribe	145	+7
Kernel Guard	138	

In 13 out of 13 replications from 4 different plots, Prescribe yielded at least a little better than the Kernel Guard hopper box treatment. Prescribe's overall yield advantage averaged out to about 7 bushels per acre over Kernel Guard. Assuming again a value per bushel of $2.11, that's an increase in revenue of about $14.77 with Prescribe. Assume that the Prescribe seed treatment costs about $15 per acre and that the Kernel Guard treatment costs about $1 per acre. So there's an increase in cost of about $14 per acre with Prescribe over Kernel Guard. The bottom line? Across 4 different plots, upgrading to Prescribe from Kernel Guard produced an overall profit of **$0.77** per acre ($14.77 added revenue - $14.00 added cost = $0.77 overall profit).

Prescribe vs. No Treatment

Combined Analysis of 3 Prescribe vs. No Insecticide Comparisons

Treatment	Yield (bu/A at 15.5% moisture)	Yield Advantage with Prescribe (bu/A at 15.5%)
Prescribe	159	+10
No Treatment	149	

In 11 out of 11 replications from 3 different plots, Prescribe yielded at least a little better than no insecticide treatment at all. Prescribe's overall yield advantage averaged out to about 10 bushels per acre over no treatment. Assuming a value per bushel of $2.11, that's an increase in revenue of about $21.10 with Prescribe. Let's assume again that the Prescribe seed treatment costs about $15 per acre. So there's an increase in cost of about $15 per acre with Prescribe over no treatment. The bottom line? Across these 3 plots, upgrading to Prescribe from no insecticide treatment produced an overall profit of **$6.10** per acre ($21.10 added revenue - $15.00 added cost = $6.10 overall profit).

If you average out Prescribe's yield advantage over all three types of checks, Prescribe produced an average yield gain of about 7 bushels per acre. However, this is probably the least useful of the numbers to look at if you're trying to make a decision on whether to try Prescribe, since you are probably upgrading from only one treatment (Gaucho, Kernel Guard, or no insecticide), not a combination of the three.

Conclusions

Across our 5 plots, upgrading to Prescribe from the lower-cost insecticides did not pay. Prescribe is comparable in performance and price to an in-furrow insecticide such as Force. These high-power treatments are recommended for serious soil insect problems, such as heavy white grub infestations. We may not have had enough of an insect problem in these five plots to really put Prescribe to the test. But there is no question there was at least some grub and other soil insect pressure on a few of these plots.

Compare the results of this analysis to the Gaucho analysis elsewhere in this publication. Across six plots, upgrading to Gaucho from lower-cost alternatives looked promising. It may be that, on an average field in our area, we have enough insect pressure to generally justify the cost of Gaucho, but not the cost of Prescribe. For now, that is only a tentative theory. We have more plots evaluating Prescribe and Gaucho on corn planned for next year. Remember that we have only shown you 1 year's worth of results on Prescribe from five plots.

Prescribe must be applied to the seed before it ever gets in the bag. It can't be applied by the grower on the farm. If you are interested in the product, call your seed supplier immediately.

Also, if you have questions about scouting for grubs and thresholds at which higher-priced soil and seed insecticides like Force and Prescribe are recommended for corn, call your Agent.

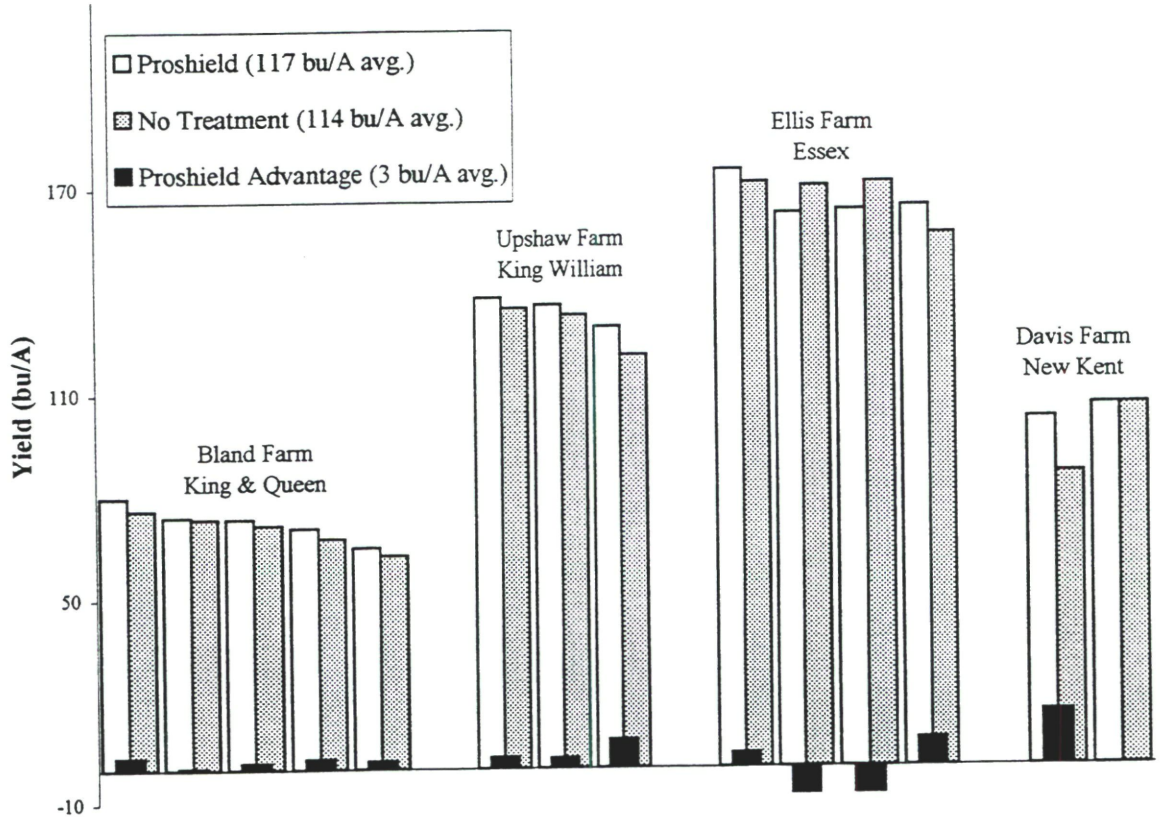
Combined Analysis of Proshield Seed Treatment Plots, 2001

Chris Lawrence, Keith Balderson, Paul Davis, David Moore

This year, our team of Extension Agents harvested 4 replicated plots involving Proshield seed treatment. Proshield corn comes already treated with Force insecticide. Force is traditionally applied directly to the soil (in-furrow) at planting. There are a number of advantages to buying Force already on the seed, such as no need for calibrating insecticide applicators and time saved loading hoppers. Whether applied in-furrow or as a seed treatment, we estimate that using Force at the labeled rate will cost $15 per acre.

The results of our 4 Proshield plots are presented individually elsewhere in this publication. The combined results of the 4 Proshield plots are shown in the chart below. Yield in bushels per acre is represented by the height of the bars. We've presented the results for each replication separately, to give you a better look at the consistency of Proshield performance across the trials. For each replication, the yield difference between the Proshield (white bar) and the check treatment (gray bar) is represented by a black bar. If Proshield yielded more than the check, the black bar is positive (goes up). If Proshield yielded less, the black bar is negative (goes down).

2001 Corn Seed Treatment Plot Results: Proshield vs. No Treatment



In 11 out of 14 replications from 4 different plots, Proshield yielded at least a little better than no insecticide treatment at all. But Proshield's overall yield advantage averaged out to only 3 bushels per acre. Across these 4 plots, Proshield clearly did not pay. Top-dollar soil insecticides like Proshield are recommended for soil insect problems that can't be controlled by cheaper treatments like Kernel Guard. Since most of our corn is rotated, white grubs are the most common target for these top-dollar soil insecticides in our area. Apparently, there were not enough soil insects of any kind in these these plots to really put Proshield to the test. This is a reminder that, whether you buy Force on the seed or in a bag, making the right decision boils down to the same old question: Do I have enough insect pressure to justify this insecticide? We don't have all the answers, but your Agents do have VA Tech guidelines for scouting for grubs and thresholds at which insecticides like Force and Proshield are recommended. Give one of us a call if you need additional information.

Robert Bland of King & Queen unloading corn into a VA Tech weigh wagon

Upshaw Proshield (Force) Seed Treatment Plot

Cooperators:

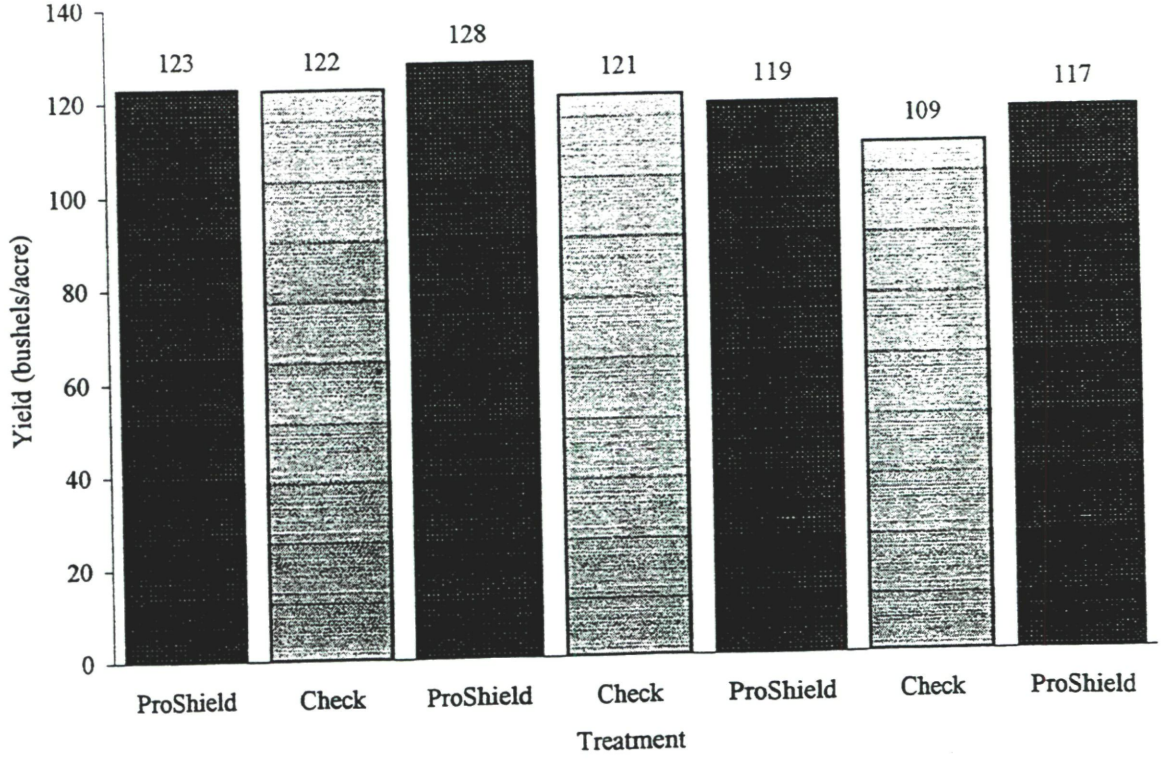
Producer:	Willie and Pickett Upshaw, King William
Extension:	Chris Lawrence, King William/King & Queen
Agribusiness:	John Fallon, Northup King

Production Practices:

Hybrid:	Northrup King N58-D1
Planting date:	After April 15
Tillage:	No-till
Population:	24,000 in 30" rows
Herbicides:	Pre: Aatrex, 2,4-D, Roundup
Insecticides:	Proshield (Force) seed treatment vs. none
Previous crop:	Split field: Double-crop and full-season soybeans
Fertilizer (lb/A):	
Broadcast:	0-0-40
Starter:	100 gal 22-11-0 (plus micros)
Sidedress:	110 lb/A N
Harvest date:	October 8, 2001

Results & Discussion

Upshaw Proshield Plot Results



Overall Plot Averages

Treatment	Yield (bu/A at 15.5%)	Proshield Yield Advantage (bu/A at 15.5%)
Proshield	121.5	+4.0
Untreated	117.5	

In this test, Willie and Pickett split the planter between seed pretreated with Proshield (Force) and untreated seed of the same type. The chart on the previous page shows results for all strips in the plot. Overall, the Proshield produced a yield advantage of 4 bushels per acre.

This field was probably like many others in our area: if white grub or other soil insect pressure had been intense after planting, the Proshield probably would have paid major dividends. But it appears the insects weren't there in large enough numbers. Willie scouted the field prior to planting and found white grubs below VA Tech threshold. At $2.14 (King William loan rate), the 4 bushel per acre yield increase would have paid an extra $8.56. This would not have covered the cost of Force, either in-furrow or on the seed, which we estimate at around $15 per acre.

For this plot, we only used the weigh wagon a couple of times to check the accuracy of the combine's yield monitor. We then let the yield monitor give us the rest of the yield results.

Special thanks to Willie for taking the time to set up and harvest this plot.

EVALUATION OF PROSHIELD SEED TREATMENT

Cooperators:	Producer: Ray, Winston, and Stephen Ellis Extension: Keith Balderson, VCE, Essex John Fallon, Northrup King
Hybrid:	NK 58-D1
Previous Crop:	Double Crop Soybeans
Soil Type:	Emporia, Kempsville, and Suffolk sandy loams
Fertilization:	Starter: 400 pounds per acre 5-10-10 plus 5 pounds per acre Sulfur and micros
Planting Date:	April 15, 2001
Seedbed Preparation:	No-till
Herbicides:	20 oz. per acre Gramoxone Extra 2 qts. per acre Bicep Magnum
Insecticides:	Proshield seed treatment vs. nothing
Date Harvested:	September 17, 2001

Treatment	Rep.	Moisture	Yield @ 15.5%
Proshield	1	16.8	175
Check	1	17.0	171
Proshield	2	16.9	162
Check	2	16.9	170
Proshield	3	16.5	163
Check	3	16.4	171
Proshield	4	16.8	164
Check	4	16.6	156

Averages:

Treatment	Moisture	Yield @ 15.5%
Proshield	16.8	166a*
Check	16.7	167a

*Means with the same letter are not significantly different at P=0.05, DMRT.

Discussion:

Proshield seed is treated with Force insecticide (tefluthrin). In this plot the target pest was white grubs. Prior to planting, the population was estimated at 1.25 grubs per square foot. The current economic threshold is 1-2 grubs per square foot. Following emergence, the field was scouted for grub feeding. Feeding in the check plots was minor, and there was no difference in yields between the treated and untreated plots.

Corn Seed Treatment Comparison

Cooperators: Producer: Robert Bland
Extension: David Moore, VCE Middlesex
Agribusiness: John Fallon, NK Seeds

Previous Crop: Soybeans

Soil Type: Suffolk Fine Sandy Loam

Date Planted: April 12, 2001

Land Preparation: No-Till in 30-inch rows

Fertilization: 20-23-60-12S pre, 50#N with herbicides, 100#Nsidedress

Crop Protection: Gramoxone, Atrazine, Simazine

Date Harvested: September 18, 2001

Treatment	Rep.	Moisture	Average Stand Count	Yield @ 15.5%
Force Treated	1	14.4%	23,000	79.9 bushels
Non-treated	1	14.3	25,500	76.3
Force Treated	2	14.3	25,500	74.3
Non-Treated	2	14.6	25,750	73.8
Force Treated	3	14.5	23,750	73.7
Non-Treated	3	14.4	24,750	71.8
Force Treated	4	14.2	23,500	70.9
Non-Treated	4	14.3	24,750	67.9
Force Treated	5	14.3	23,250	65.1
Non-Treated	5	14.1	23,000	62.7
Average Force Treated			23,850	72.8
Average Non-Treated			24,350	70.5

Discussion:
Dry plot. New technology offers seed treated with soil insecticide. Several plots on the Middle Peninsula this season showed some increase in yield, but were not economically feasible. Consistently, the Force-treated seed offered a 2-3 bushel increase in yield. Grubs present during pre-plant scouting showed 1 per square foot of soil. Costs of seed treatment are comparable to in-furrow soil insecticide.

New Kent Proshield Corn Seed Insecticide Study
Pamunkey Farms, New Kent

Producer:	Stanley, David & John Hula, Renwood Farms	
Cooperators:	John Fallon, Northrup King; Lee Wooten, Renwood Farms; Paul Davis, New Kent Extension	
Planting Date:	April 23, 2001	
Tillage:	No-Till	
Population:	21,500	
Soil Type:	Pamunkey and Tetotum sandy loams	
Fertilizers:	Starter	65-34-0 + 1 Zn + .2 B
	Broadcast	80 lbs potash
	Sidedress	110# N
Herbicides:	Preplant	1.5 pt. Gramoxone Extra + 2 pt. Bladex
	Preemergence	3 pt. Atrazine + 3 pt. Princep
Harvest Date:	9/26/01	

Insecticide Seed Treatments

Hybrid: Northrup King N58-D1

	Rep 1	Rep 2	bu/ac / % Moisture / Population	
Proshield	102	106	104 bu/ac @17.8%	21,100
Kernel Guard	95	119	107 bu/ac @ 17.9%	19,900
Untreated	86	106	96 bu/ac @ 17.7%	17,200

Discussion: Due to large plot size we were only able to get 2 replications this year. Proshield is ®Force insecticide as a seed treatment. The Proshield cost per acre will be equivalent to Force in-furrow treatments. The white grup pressure in this field was above threshold > 2 grubs per square foot.

Work needs to be done in sampling soybean fields after harvest in November/December, that will be planted into corn, to determine if white grub populations are at threshold and some type of control needed. It's too late to sample in the spring, if you want to use Proshield treated seed corn, because of the early seed corn order discounts, and the seed companies have already made all their treatment decisions for each hybrid by planting time. Where you have had historical white grub problems in no-till corn fields these type of seed insecticide treatments should be safer to handle, more insect specific and very convenient.

EVALUATION OF SIDEDRESS SULFUR ON CORN

Cooperators:	Producer: Ray, Winston, and Stephen Ellis Extension: Keith Balderson, VCE, Essex
Hybrid:	Pioneer 3573
Previous Crop:	Double Crop Soybeans
Soil Type:	Suffolk sandy loam
Fertilization:	Starter: 400 pounds per acre 5-10-10 plus 5 pounds per acre Sulfur and micros Broadcast: none Sidedress: 120 pounds per acre nitrogen or 120 pounds per acre nitrogen and 15 pounds per acre sulfur
Planting Date:	April 5, 2001
Seedbed Preparation:	No-till
Herbicides:	20 oz. per acre Gramoxone Extra 2 qts. per acre Bicep Magnum
Insecticides:	Kernel Guard
Date Harvested:	August 31, 2001

Treatment	Rep.	Moisture	Yield @ 15.5%
24-0-0-3	1	21.0	155
30% UAN	1	20.3	157
24-0-0-3	2	20.5	160
30% UAN	2	20.8	166
24-0-0-3	3	21.0	167
30% UAN	3	20.9	160

Averages:

Treatment	Moisture	Yield @ 15.5%
24-0-0-3	20.8	161a*
30% UAN	20.7	161a

*Means with same letter are not significantly different at P=0.05, DMRT.

Discussion:

The total sulfur uptake for a 161 bushel per acre corn crop can be estimated at 26 pounds of sulfur per acre. Five pounds of sulfur was applied in the starter fertilizer, and the most recent atmospheric deposition map shows approximately 17 pounds of sulfur being received in the northeastern region of Virginia. In addition, some mineralization would also occur. Ear leaf tissue samples showed either "high" or "sufficient" nitrogen and sulfur levels in both the 30% UAN treatment and the 24-0-0-3 treatment. In this plot the sulfur did not provide a yield increase. A yield response to sulfur is most likely to occur on sandy soils.

4-Rivers Ag. Field Day Corn Hybrid Plot
Pamunkey Farms, New Kent

Producer:	Stanley, David & John Hula, Renwood Farms	
Cooperators:	Jim Oliver, Monsanto; Buck Tharpe, UAP; Daryl Clay, Pioneer Seed; Brian Noyes & Jim Wallace, Colonial SWCD; Lee Wooten, Renwood Farms, Paul Davis, New Kent Extension	
Planting Date:	April 23, 2001	
Tillage:	No-Till	
Population:	24,000 dropped of 34K77 and 28,500 of 31R88	
Soil Type:	Pamunkey and Tetotum sandy loams	
Fertilizers:	Starter	65-34-0 + 1 Zn + .2 B
	Broadcast	80 lbs potash
	Sidedress	110# N
Herbicides:	Preplant	1.5 pt. Gramoxone Extra + 2 pt. Bladex
	Preemergence	3 pt. Atrazine + 3 pt. Princep
Insecticides:	Kernel Guard	
Harvest Date:	9/26/01	

Corn Hybrids (4 rows each x 1300')

Early		Yield	% Moisture
	Check (Pioneer 34K77)	161	19.0%
	Asgrow RX708	150	19.3%
	Augusta A3685	148	21.4%
	Chemgro 7294	161	20.1%
	DeKalb 63-03	138	19.8%
	Doebler's 516XY	139	17.8%
	Dyna-Gro 5478	145	18.8%
	Garst 8585	140	17.1%
	NK N58-D1	131	17.7%
	Pioneer 34K77	159	18.2%
	Southern States 710	149	18.4%
	Vigoro V5320	138	19.5%
	AVG.	**145**	**18.9%**

Mid

Check	167	19.9%
Asgrow RX764	154	18.9%
Augusta 4487	159	20.5%
Chemgro 7388	155	21.2%
DeKalb 66-50	169	21.3%
Doebler's 638XYG	149	20.5%
Dyna-Gro 5460 RR Bt	167	21.8%
Garst 8362	170	19.9%
NK N70-D5	172	20.2%
Pioneer 33G26	183	20.0%
Southern States 720RR	166	20.2%
Vigoro V54R95RR	165	19.6%
AVG.	**164**	**20.4%**

Full

Check	166	19.4%
Asgrow 826	162	21.0%
Augusta A3562	173	22.2%
Chemgro 7796	178	21.9%
DeKalb 69-70	153	24.0%
Doebler's 818XYG	151	20.7%
Dyna-Gro 5516	155	21.1%
Garst 8342	145	20.9%
NK N74-H3	125	21.3%
Pioneer 32R25	160	20.2%
Southern States 730Bt	142	21.0%
Vigoro V5800	146	19.6%
Check	159	19.3%
AVG.	**154**	**21.3%**

2001 ESSEX COUNTY CORN HYBRID DEMONSTRATION PLOT

Cooperators:	Producer: Midway Farms, Inc. Extension: Keith Balderson, VCE, Essex Agribusiness: Various Seed Company Representatives
Hybrid:	Various
Previous Crop:	Double Crop Soybeans
Soil Type:	Emporia and Kempsville sandy loams
Fertilization:	Starter: 40-20-0 plus Sulfur and micros Broadcast: 70 pounds per acre potash Sidedress: 120 pounds per acre nitrogen
Planting Date:	April 4, 2001
Seedbed Preparation:	No-till
Herbicides:	1.6 qts. per acre Bicep Magnum 2 pts. per acre Gramoxone
Insecticides:	2 oz. Warrior T per acre in herbicide application
Date Harvested:	September 14, 2001

Hybrid	Moisture	Yield @ 15.5%
Asgrow RX764	19.9	186
Asgrow RX826	21.7	200
Check-Augusta 285	20.1	186
Augusta 4487	22.5	204
Augusta 3685	21.5	193
Check	20.7	199
Chemgro 7294	20.4	203
Chemgro 7692	23.6	176
Check	20.6	193
Chemgro 7796	24.0	218
Dekalb 66-50	21.3	191
Check	21.1	180
Dekalb 63-03	19.5	189
Dekalb 60-08	17.2	202
Check	20.8	200
Doeblers 638XYG	20.7	185
Doeblers 749XYG	22.1	206
Check	19.8	181
Doeblers 760DT	20.7	195
Dyna-Grow 5456	21.0	211
Check	20.4	199
Dyna-Grow 5478RRBT	19.8	202
Dyna-Grow 5460ABT	20.4	200
Check	20.3	204
NK 58-D1	17.1	189
NK 79-L3	21.2	199

Check	20.5	175
Pioneer 33G26	19.0	198
Pioneer 32R25	20.6	210
Check	19.5	189
Asgrow RX708	18.7	193

Discussion:

These are excellent yields. Unfortunately, the yields of the check plots showed a lot of variability. It was noted, when measuring the lengths of the plots following harvest, some of the check plots had skips in the plots. This probably explains the high variability in the yields of the check plots. This is another example of the importance of using **replicated** plot results when making management decisions. Use this and **replicated** data from the Virginia Corn Performance Trials when making hybrid selections for 2002.

Gloucester Area Field Day Corn Plot

Cooperators:	Producer:	Charles Rich "Connie" Carlton
	Extension:	David Moore, VCE Middlesex Keith Balderson, VCE, Essex Donna Tuckey, IPM Agent
	Agribusiness:	Company Representatives from, Northrup King, Doebler's, Pioneer Chemgro, Monsanto, Augusta, Southern States, Dyna-Gro
Previous Crop:	Soybeans	
Date Planted:	April 10, 2001	
Soil Types:	Wrightboro, Suffolk, and Emporia Sandy Loams	
Land Preparation:	No-till in 30 inch rows	
Fertilization:	0-60-130 preplant, 17.5-15.5-0-.1Zn as starter 75# N with herbicide, 75# N sidedress	
Crop Protection:	1.8 qt.Bicep + 1 pt. Aatrex 1.25 pt Gramoxone, 1pt. 2,4-D, 2 oz. Warrior	
Date Harvested:	September 27, 2001	

Variety	Moisture	Yield @15.5%	% of Check
Check (Augusta285)	15.3%	158.2 bushels	
NK N70-D5	15.5	158.7	102
Check	15.5	153.8	
NK N58-D1	14.4	147.5	94
Check	15.6	158.6	
Doebler's HC540	15.0	159.2	99
Check	15.3	163.5	
Doebler's 760DT	15.6	157.6	98
Check	15.4	158.5	
Doebler's 797 RYG	17.0	174.4	106
Check	15.4	171.6	
Pioneer 32R25	14.9	182.9	107
Check	15.5	170.0	
Pioneer 33G26	15.9	171.1	101

Check	15.4	169.1	
Chemgro 7796	17.2	187.1	113
Check	15.1	161.6	
Cemgro 7311	16.8	160.3	106
Check	16.6	141.5	
Chemgro 7294	16.5	151.2	106
Check	16.3	144.4	
Dekalb 69-70	22.4	131.7	90
Check	16.3	146.8	
Dekalb 66-50	16.6	158.0	106
Check	15.9	150.1	
Asgrow RX 826	15.3	155.7	104
Check	15.6	150.3	
Asgrow RX 764	15.0	159.1	99
Check	15.4	170.8	
Dyna-Gro 5456	15.2	149.2	94
Check	15.7	146.3	
Dyna-Gro 5478BtRR	15.2	128.7	90
Check	15.5	140.5	
Augusta 3685	16.6	153.7	106
Check	15.6	150.5	
Augusta 4487	15.0	173.7	114
Check	16.2	155.5	
Southern States 1150	27.0	108.8	70
Check	15.6	154.5	
Southern States 691	14.7	176.1	110
Check	15.7	164.2	
Southern States 720	14.8	173.0	106
Check	16.2	161.9	
Southern States 710	14.9	158.8	99
Check	16.9	160.1	
Southern States 859CL	17.4	161.9	102
Check	15.2	156.4	

Discussion:

Many thanks to Charles Rich for planting and harvesting the plot and hosting the field day. Also thanks to all the companies for supplying seed and for attending the field day and discussing your hybrids. Very good yields for the dry season the plot experienced. Pay attention to the % of Check, which gives a good idea how the hybrid did even though the soil types differed across the field. Please use this and other Virginia Tech corn hybrid performance information when making planting decisions for 2002. Oh yea, Alvin Phelps won $100.00 for picking the highest yielding hybrid at the field day.

CORN HYBRID CHALLENGE

Cooperators:

Producer: Robert Respess, Jr.
Extension: David M. Moore, VCE Middlesex
Agribusiness: Kurt Walbert, Chemgro
Carter Borden, Doebler's
Daryl Clay, Pioneer
John Fallon, NK Seeds

Previous Crop: Soybeans

Soil Type: Eunola & Johns Sandy Loams

Land Preparation: Deep Ripping
No-till into 30-inch rows

Date Planted: May 4, 2001

Fertilization: 44-80-120-15S pre-plant
70-0-0 with herbicides
70-0-0 sidedress

Crop Protection: 1 qt. Glyphomax, 1 qt. Atrazine, 1.5 qts. Simazine

Date Harvested: October 12, 2001

Hybrid	Moisture %	Yield @ 15.5%	% of Check
Check(Doebler's 642)	14.7%	128.6	
Pioneer 32R25	14.9	155.5	120%
Check	14.8	131.4	
Pioneer 32R25	15.2	174.4	133%
Check	14.9	129.8	
Chemgro 7796	17.5	156.4	110%
Check	14.9	155.5	
Chemgro 7796	16.6	164.0	109%

Check	14.6	146.3	
Chemgro 7311	15.3	178.0	125%
Check	14.8	138.7	
Chemgro 7311	14.9	156.0	110%
Check	14.8	146.0	
Chemgro 7294	15.1	164.9	117%
Check	14.9	136.1	
Chemgro 7294	14.6	172.7	120%
Check	14.7	152.5	
NK 58-D1	14.2	145.5	95%
Check	14.2	154.9	
NK 58-D1	13.8	133.4	90%
Check	14.4	141.9	

Discussion:
A replicated plot challenging the producer's Doebler's 642. Use this and other Virginia Tech Corn Hybrid information when making planting decisions for 2002.

COMPARISON OF A HYBRID TO ITS Bt EQUIVALENT

Cooperators:	Producer: W. E. Stevens
	Extension: Keith Balderson, VCE, Essex
Hybrid:	Pioneer 33G26 vs. Pioneer 33G30 Bt
Previous Crop:	Double Crop Soybeans
Soil Type:	Suffolk sandy loam
Fertilization:	Broadcast: 83-46-60
	Sidedress: 70 pounds of nitrogen per acre
Planting Date:	April 16, 2001
Seedbed Preparation:	No-till
Herbicides:	1.5 pts. per acre Gramoxone Extra, 1.5 pts. per acre simazine, 1.5 pts. per acre atrazine
Insecticides:	Kernel Guard
Date Harvested:	October 9, 2001

Treatment	Rep.	Moisture	Yield @ 15.5%
Pioneer 33G30 Bt	1	16.5	152
Pioneer 33G26	1	16.7	177
Pioneer 33G30 Bt	2	16.2	160
Pioneer 33G26	2	16.3	169
Pioneer 33G26	3	16.4	172
Pioneer 33G30 Bt	3	16.2	152
Pioneer 33G26	4	16.4	180
Pioneer 33G30 Bt	4	16.5	146

Averages:

Treatment	Moisture	Yield @ 15.5%
Pioneer 33G30 Bt	16.4	153a*
Pioneer 33G26	16.5	175b

*Means with a different letter are significantly different at P=0.05, DMRT.

Discussion:

This is the fifth year of evaluating Bt hybrids in these types of plots. This plot verifies our earlier conclusion: In most fields in most years, the Bt gene will not increase yield on **full-season** corn grain in the Middle Peninsula and Northern Neck. In this plot, the standard hybrid actually yielded significantly higher than the Bt hybrid.

COMPARISON OF A HYBRID TO ITS Bt EQUIVALENT

Cooperators:	Producer: Robert P. Longest
	Extension: Keith Balderson, VCE, Essex
	Agribusiness: Jim Oliver, Monsanto
Hybrid:	Dekalb 647 vs. Dekalb 647 Bt
Previous Crop:	Double Crop Soybeans
Soil Type:	Kempsville sandy loam
Fertilization:	Starter: 200 pounds per acre of 15-15-0 plus micros
	Broadcast: 0-0-40 per acre
	Sidedress: 100-0-0-12 per acre
Planting Date:	April 18, 2001
Seedbed Preparation:	No-till
Herbicides:	1.5 pts. per acre Gramoxone Extra, 1.8 qts. per acre Bicep Magnum, 1 pt. per acre atrazine
Insecticides:	Kernel Guard
Date Harvested:	October 11, 2001

Treatment	Rep.	Moisture	Yield @ 15.5%
Dekalb 647	1	16.3	152
Dekalb 647 Bt	1	16.5	152
Dekalb 647	2	16.5	154
Dekalb 647 Bt	2	16.7	147
Dekalb 647	3	16.6	147
Dekalb 647 Bt	3	16.4	149
Dekalb 647	4	16.5	155
Pioneer 647 Bt	4	16.5	158

Averages:

Treatment	Moisture	Yield @ 15.5%
Dekalb 647	16.5	152a*
Dekab 647 Bt	16.5	152a

*Means with the same letter are not significantly different at P=0.05, DMRT.

Discussion:

This is the fifth year of evaluating Bt hybrids in these types of plots. This plot verifies our earlier conclusion: In most fields in most years, the Bt gene will not increase yield on **full-season** corn grain in the Middle Peninsula and Northern Neck.

CORN HYBRID CHALLENGE PLOT

Cooperators:	Producer: Robert P. Longest Extension: Keith Balderson, VCE, Essex
Hybrid:	Pioneer 33K81 vs. Augusta 285
Previous Crop:	Double Crop Soybeans
Soil Type:	Kempsville sandy loam
Fertilization:	Starter: 200 pounds per acre 15-15-0 plus micros Broadcast: 0-0-40 per acre Sidedress: 100-0-0-12 per acre
Planting Date:	April 18, 2001
Seedbed Preparation:	No-till
Herbicides:	1.5 pts. per acre Gramoxone Extra, 1.8 qts. per acre Bicep Magnum, 1 pt. per acre atrazine
Insecticides:	Kernel Guard
Date Harvested:	October 11, 2001

Treatment	Rep..	Moisture	Yield @ 15.5%
Pioneer 33K81	1	16.0	157
Augusta 285	1	16.3	149
Pioneer 33K81	2	16.1	152
Augusta 285	2	16.2	148
Pioneer 33K81	3	16.2	154
Augusta 285	3	16.2	149

Averages:

Treatment	Moisture	Yield @ 15.5%
Pioneer 33K81	16.1	154
Augusta 285	16.2	149

Discussion:
Both of these hybrids in the 110-day maturity range yielded well. Pioneer 33K81 was slightly better over all 3 replications.

COMPARISON OF A Bt HYBRID TO A STANDARD HYBRID

Cooperators:
Producer: Midway Farms, Inc.
Extension: Keith Balderson, VCE, Essex County
Agribusiness: Daryl Clay, Pioneer Hi-Bred

Variety: Pioneer 34K77 vs. 34K78 Bt
Soil Type: Emporia sandy loam
Fertilization: Broadcast: 70 pounds potash per acre
Starter: 200 pounds of 22-11-0+micros
Sidedress: 120 pounds of nitrogen per acre
Planting Date: April 7, 2000
Seedbed Preparation: No-till
Herbicides: 1.5 pts. per acre Gramoxone Extra, 1.8 qts. per acre Bicep Magnum, 1 pt. atrazine per acre
Insecticides: Kernel Guard hopper box treatment
Date Harvested: September 29, 2000

Treatment	Rep.	% Moisture	Yield (Bu./A @ 15.5%)
Pioneer 34K77	1	18.2	189
Pioneer 34K78Bt	1	18.2	179
Pioneer 34K77	2	18.4	195
Pioneer 34K78Bt	2	17.9	179
Pioneer 34K77	3	18.2	187
Pioneer 34K78Bt	3	17.7	182
Pioneer 34K77	4	18.4	190
Pioneer 34K78Bt	4	17.8	189
Averages:			
Pioneer 34K77		18.3	190
Pioneer 34K78Bt		17.9	182

Discussion:
The purpose of this plot was to compare the performance of a standard hybrid with its Bt equivalent. In this plot, the Bt hybrid did not increase yields. Both hybrids showed excellent standability, indicating low European corn borer pressure.

Bt AND NON-Bt CORN HYBRID COMPARISON PLOT

Cooperators: **Producer:** John M. Hundley and John M. Hundley, Jr.
Extension: Keith Balderson, VCE, Essex County
Agribusiness: Daryl Clay, Pioneer Hi-Bred

Variety: Various
Soil Type: Atlee silt loam and Kempsville sandy loam
Fertilization: Broadcast: 65-55-50
Sidedress: 85 pounds of nitrogen per acre
Planting Date: April 14, 2000
Seedbed Preparation: No-till
Herbicides: 1.5 pts. per acre Gramoxone Extra, 1.8 qts. Bicep per acre and 1 pt. atrazine per acre
Insecticides: Kernel Guard hopper box treatment
Date Harvested: October 3, 2000

Hybrid	% Moisture	Yield (Bu./A @ 15.5%)
Pioneer 33V08 Bt	17.9	185
Pioneer 3394	17.6	178
Pioneer 34K78 Bt	17.4	180
Pioneer 3394	17.4	184
Pioneer 34K77	17.0	194
Pioneer 3394	17.2	190
Pioneer 33G29 Bt	17.8	188
Pioneer 3394	17.5	187
Pioneer 33G26	17.7	209
Average of 4 Pioneer 3394 Plots		185

Discussion:
Area corn producers continue to ask about the advantage of planting Bt corn hybrids. The purpose of this plot was to compare genetically similar hybrids with and without the Bt gene. A standard hybrid (3394) was used as the check. These results do not show an advantage to planting Bt corn. Past on-farm plots have not shown a consistent advantage to planting Bt hybrids (for full season plantings). All double crop plantings should utilize Bt corn hybrids.

Pioneer Full Season Genetics Corn Challenge Plot
Davis Farm, New Kent

Cooperators: Daryl Clay, Pioneer Seed Rep., Ralph Randolph, local dealer; Clifton Davis, producer; Paul Davis, Extension Agent.
Planting Date: April 24, 2001
Soil Type: Fine sandy loam, Altavista
Tillage: No-Till → 36" row spacing
Previous Crop: Double crop soybeans
Fertilizers: Broadcast: 80-50-100 April 5, 2001
Sidedress: 80 #N
Population: 24,000
Herbicides: 4/26/01 1.8 qts. Atrazine
2.5 pts Harness
1.5 pts Gramoxone Extra + Surfactant
Treatments: (6 rows each) x (4 reps)
Harvest Date: 10/1/01

	--- bu/Ac---				Avg.		Final
	Rep 1	Rep 2	Rep 3	Rep 4	Yield	% Moist	Population
Pioneer 3140 (released 1987)	146.0	111.9	126.5	160.6	136.2	20.4%	17,400
Pioneer 3163 (released 1993)	151.0	131.5	131.5	155.9	142.5	20.3%	20,300
Pioneer 31G98 (released 2000)	147.3	132.0	162.5	193.0	158.7	17%	23,900
Pioneer 31B13^{Bt} (released 2000)	119.6	94.7	104.6	149.5	117.1	19%	23,200

Discussion: Wanted to see what improvements, if any, have been made in plant breeding to increase yields on similar maturity corn hybrids. This study showed a good yield increase with the newer releases except for the Bt hybrid. This was not surprising to see the Bt hybrid planted full season not yielding better than standard hybrids. These yields were good considering the dry weather conditions (between June 17 and July 23 this crop only received 0.60 inches of rain fall) this summer. I recommend trying new hybrids on part of your acreage each year to take advantage of the new genetics and improvements in plant breeding.

Lancaster/Northumberland Corn Hybrid Plots, 2001
Yield Results

Producer-Cooperators – Kenny and Allen Kent
Extension Agent – Ginny Pitman Barnes
Soil Type – Sassafras fine sandy loam
Fertilizer – Broadcast – 50-60-50
Starter – none
Planted – April 10, 2001 No-till with a Kinze 3000
Plant Population – 23,500
Herbicide –Aatrex
Insecticide – Kernel Guard
Row width – 30 inches
Harvest date - September 24, 2001
Harvesters – Kenny Kent, Allen Kent, Ginny Barnes

Hybrid	Weight	TW	% Moisture	Area (acre)	Yield (bu/acre)
Augusta 285 (check)	840	54	20.9	0.0744	188.7
Pioneer 33G26	825	59	20	0.0744	187.5
Pioneer 32R25	730	60	18.5	0.0744	169
Chemgro 7796*		60	25	0.0744	191.7*
Chemgro 7227	890	59	21.1	0.0744	199.5
NK 70-D5	815	61	19.9	0.0744	185.4
NK 58-D1	735	62	17.4	0.0744	172.4
Augusta 285 (check)	825	57	19	0.0744	189.8
Asgrow RX 708	805	59	18.3	0.0744	186.8
Asgrow RX 670	810	60	18.2	0.0744	188.2
Dekalb 58-78	780	58	17.8	0.0744	182.1
Dekalb 60-08	810	61	17.5	0.0744	189.8
Augusta 285 (check)	880	59	19.7	0.0744	200.7
Doeblers 638	780	60	20.1	0.0744	177
Doeblers 19023 Ex	835	59	20.4	0.0744	188.8
Augusta 4487	925	59	19.8	0.0744	210.7
Augusta 3685	930	60	19.3	0.0744	213.2
Augusta 285 (check)	825	61	18.3	0.0744	191.5
* Mechanical/operator error - best estimate of weight.					
Bushels per acre corrected to 15.5% moisture.					
Average yield of check (Augusta 285): 192.7 bu/ac					
Average yield of other hybrids: 188.7 bu/ac					
Average yield of entire plot (check + hybrids): 189.6 bu/ac					