



Partners

Conservation Technology Information Center

November/December 2003

Vol. 21 No. 6

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A Look Back at 2003



John Hassell, executive director of CTIC.

As we come to the end of 2003, we like to reflect on where we've been and consider our future direction. 2003, like other years, presented its share of challenges. The agriculture industry continued to feel economic pains, as did people who make their living off the land. And, like many other nonprofit organizations, CTIC faced significant funding challenges. Early in the year, we had to look carefully at our financial picture and determine whether we could continue to provide products and services at the same level. Today, I am proud and pleased to report that thanks to a creative and supportive staff, CTIC has reduced expenses and maintained a full work force without compromising the level of services to our members and customers.

2003 was a year of change. In February, CTIC was acknowledged as a stand-alone subsidiary of the National Association of Conservation Districts, a designation that resulted in more autonomy for the CTIC Board of Directors. At the same time, our Board was restructured from 25 members to 15 members, and Bill Richards was elected the first Chair of the new Board. Bill is a strong conservation advocate, and he brings his experience as chief of the Soil Conservation Service (1990-1993) to the leadership of our organization. Other officers include Scott Hedderich (Pioneer, a DuPont Company) as First Vice-Chair, Neil Strong (Syngenta Crop Protection) as Second Vice-Chair, Ray Hoyum (IMC Global) as Treasurer, and Chris Foster (John Deere) as Secretary.

Among our proudest accomplishments for 2003 are the 17 local Core 4 Conservation Alliances that we have helped establish or expand throughout the country. CTIC staff teams provide facilitation services to help new groups through the formation stage and also provide ongoing support through training, networking, list serve access and other services. Ten of these alliances applied for and received mini-grants for up to \$2,500 to help them with their efforts to support and promote the principles of Core 4 Conservation – *Better Soil, Cleaner Water, Greater Profits and a Brighter Future*. And, for the second straight year, Capital Agricultural Property Services, Inc. (CAPS), Syngenta Crop Protection and IMC Global sponsored the Core 4 Conservation Awards to honor innovative farmers and an alliance for their dedicated efforts to conservation.

As we consider 2004 and our future direction, CTIC recognizes that more challenges lie ahead and that we must strengthen our commitment to conservation. We need to do more. As I've said before in this column, I believe that most of the current environmental programs that attempt to address water and air quality problems attributed to agriculture look only at symptoms. The true problem – poor soil quality – is often over looked. We need to not only work to keep soil in place but to improve its quality as well. If we do this, our society will see a reduction in agricultural-related environmental problems, an increase in production potential for food, fiber and energy, and a decrease in the amount of agricultural inputs. Conservation starts with good soil quality, and, as a trusted source of tools and information for agricultural conservation, CTIC proudly commits to promoting soil quality in everything we do. We encourage our members and partners to join with us in delivering this message. Together, we are a louder, more powerful voice sending a consistent message: we are committed to conservation and we can make a difference.

Partners is published six times annually by the Conservation Technology Information Center (CTIC), a nonprofit, public-private partnership. Established in 1982 under the charter of the National Association of Conservation Districts, CTIC is independently funded by memberships, government agencies, foundations, product sales and subscriptions.

MISSION

CTIC leads the development of public/private partnerships that promote the enhancement of soil, water and air quality and sound habitat management by equipping agriculture with realistic, affordable and integrated solutions.

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ON THE COVER

Jay Hardwick believes that when there is a shift in the way people produce, many more benefits will emerge, such as this beautiful landscape found on his property in Louisiana.

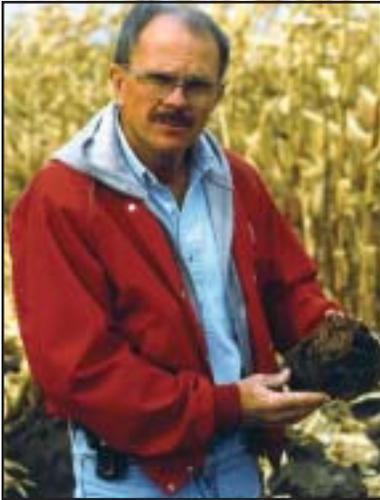
Photo Credit: Jay Hardwick.





Carbon Impacts Soil Quality

Illinois Farmer Speaks Candidly about Managing for Soil Quality



Jim Kinsella, Illinois farmer, has seen the benefits of managing for soil quality.

In 1975, when Jim Kinsella returned to farm the McLean County, Ill., family farm where he grew up, he was astonished by the damage that 15 years of tillage had done to the quantity and quality of the topsoil. From that day forward, Kinsella has practiced continuous no-till on the 1,300 acres of corn and soybeans grown on the 21 different soil types he farms. The dramatic improvement this system has made to his soils has made Kinsella a passionate advocate for continuous no-till.

Partners sat down with Kinsella to discuss why he chose and advocates managing for soil quality.

What convinced you to adopt conservation and begin managing for soil quality?

The basic knowledge I acquired during my studies for a master's degree in soils, combined with the soil erosion and degradation I was observing across the entire Corn Belt, convinced me that there just had to be a better way to take care of our most valuable asset - our soil.

When did you decide to share the message with others?

When the conservation compliance provisions of the '85 Farm Bill required most of the highly erodible land to be no-tilled, I saw many farmers making the same mistakes I made in the beginning, so I felt compelled to share the lessons I learned and the possible solutions. I began working with other farmers and giving tours of my farm, demonstrating how to get around some of the problems they were experiencing. I also wrote a no-till manual.

In the summer of 1987, we hosted a five-day field day with over 3,000 attendees. Soon after, we built the Ag Technology Center to accommodate meetings and field days for sharing ideas and demonstrating the effects continuous no-till had on production and soil quality. Since that time, we have had more than 80,000 people visit our facility and farm.

What drives you to want to convince others to switch to conservation agriculture?

It's my concern for the long-term viability of agriculture and my concern for the total environment. After seeing the positive impact that continuous no-till has had on our farm and on farms all over the country, I feel obligated to share the information and experience I have gained.

What is the most convincing argument for conservation agriculture?

The most convincing argument for continuous no-till is the steady improvement in soil quality over time. The steadily increasing organic matter im-

proves soil structure which results in better water infiltration, less and cleaner runoff water, improved air quality and more consistent yields. These benefits should be enough to encourage every farmer to at least try no-till and for the public to provide incentives to help farmers implement the practice. One obstacle to more conservation is that these improvements take time to accrue, and currently our industry seems dominated by short-term thinking. Another obstacle is the lack of training, understanding and a definitive test for evaluating soil quality. We've been told for generations that tillage improves the soil, but in 99 percent of Corn Belt soils, tillage is a degrading event.

What can be done to increase adoption of continuous no-till?

Just spreading the message will not make much difference now. Everyone that wanted to hear the message about the benefits of no-till has heard it clearly. The only way we are going to get more conservation on the ground is to provide enough economic incentive to encourage conventional farmers to change. The logical approach for this incentive would be to pay farmers for the carbon they are sequestering (taking CO₂ out of the atmosphere and storing it in their soils as organic matter.) There is a lot of talk about private carbon trading schemes, but to be effective this program should be administered by the U.S. Department of Agriculture.

To contact Mr. Kinsella or get more information about his farm, Tel.: (309) 365-8041 or E-mail: kfi@dtnspeed.net.



Soil Quality Has to Come First

Building Organic Matter Improves Soil, Air and Water *By Angie Fletcher*

Editor's Note

In the September/October issue of Partners Magazine, the feature article focused on a growing trend in agricultural production - switching from managing for tolerable soil loss to managing for soil quality and how soil organic matter impacts soil quality. In this issue, we expand on this topic of soil quality and show how producers improve their entire operation by focusing on it.

How well soil functions has direct effect on how plants grow. Yet, many producers in the United States are depleting their soil resource with practices known to cause erosion, such as conventional tillage, perhaps unknowingly because the effects are masked by improved hybrids and other improved technology. There are, however, producers who practice conservation -

buffers, wetlands, no-till, etc. - because it is the right thing to do for their operation and the environment.

Bill Richards, farmer and chair of the Conservation Technology Information Center, says, "Soil quality is tied to every facet of production. It's also tied to water quality and erosion." He believes that people make a mistake by solely talking about water or air quality when "they should accept the fact that soil quality has to come first."

No Reason to Plow

Richards graduated from college as a city boy, not a farmer. "I didn't know how and didn't see any scientific reason to plow. So we didn't." He and his sons farm roughly 3,000 acres of continuous no-till corn and soybeans in Circleville, Ohio (50 miles south of Columbus). "We haven't plowed for over 40 years," he says.

The benefits of managing for soil quality paid off for the Richards first in the form of savings: time, inputs, equipment, and ultimately, money. "Later we discovered that we were preventing erosion, and that helped when compliance issues came around," adds Richards.

"In the short-term, we saved on trips across the field, and reduced fuel, labor and equipment costs," explains Richards. "We have two large planters and two old tractors (over 25 years old)," he says. "It just proves how cheap it is to follow the system after soil quality really starts improving." He says it takes about 5 years of continuous no-

till to really see a big difference in the improved soil quality, adding that planting gets easier each year.

According to Richards, the long-term benefits of increasing soil organic matter are improved productivity, soil quality and easier management. "The most impressive improvement, however, is in water infiltration," he says.

"We improved water infiltration more than 10 fold," explains Richards. One inch of water was poured into each of three cylinders, that were placed on his neighbor's field, on his field and on a virgin fence row that had not been cultivated for more than 100 years. "The neighbor's field absorbed the water in 24 minutes; my field absorbed the water in 2.4 minutes and the fence row absorbed the water in 24 seconds."

Researchers, such as Dr. John Kimble, Natural Resources Conservation Service (NRCS) lab in Lincoln, Neb., have done extensive testing on the Richards' property and have found that the dedicated no-tillers are improving soil quality by improving organic matter. "Our soil is much more biologically active," says Richards.

As an advocate for sustainable agriculture, Richards volunteers a great percentage of his time to promote conservation practices. His desire to raise the conservation ethic in America is driven by the fact that sustainable agriculture is not only good for the producers, but for society and the entire world.

Richards says, "The message here is continuous no-till."

No Mystery to Uncover

According to the NRCS, when a producer addresses conservation issues by focusing



Henrick

While there are those that deny that no-till can be done in the hard Delta soils, Jay Hardwick proves them wrong. After more than 15 years of continuous no-till, Jay Hardwick finds the soil easy to plant into.



on enhancing soil quality and promoting better management of soil organic matter, he or she also will realize the benefits of cover crops, crop rotations, conservation tillage and more.

Don Gohmert, state conservationist for NRCS in Louisiana, wonders if people think there is a mystery to sustainable agriculture. "There isn't," he says. "Once a land manager sets soil quality as a goal, a series of changes follow, both in and out of the soil."

Gohmert points to Jay Hardwick, a producer in Louisiana, as an example. Hardwick, who farms approximately 7,300 acres of Delta soils, where conventional tillage is 'king' and people believed no-till couldn't be done, with cotton (his principal crop), wheat, corn, grain sorghum, soybeans and peanuts, is a huge advocate of managing for soil quality. "Jay is probably one of the most complete conservation farmers we have in the state," says Gohmert. "He manages for a holistic approach - trying to address the needs of the soil, plants, wildlife and critters, habitat and so forth."

With a doctorate in art, Hardwick didn't set out to be a cotton producer. Prior to marrying into a farming family, he taught and chaired the art department at Southern Methodist University. When the first of two children was about to be born, Hardwick and his wife decided to return to her family's farm for one year. The family owns more than 20,000 acres, with more than 6,000 acres of hardwood bottom timber. "That was in 1981," says Hardwick, "and we're still here."

After working for his father-in-law as a hand, then running parts of the operation, Hardwick

eventually became operations manager for the entire operation. "We had been mono-cropping cotton and soybeans for years," he says. Discouraged by what was happening with the declining soil organic matter and declining yield, Hardwick thought, "There's got to be



According to Jay Hardwick, the support system in agriculture and the wealth of information he received when entering into it has allowed him to produce these cotton seedlings that emerge through wheat and corn residue, which act as a soil protector and moisture retainer.

something we are doing wrong or that we are not doing that's right."

"We were seeing great stress in the plants, particularly cotton. Water holding capacity and soil aggregates were poor," says Hardwick. "We had less than .5 percent of organic matter." He notes that once he started looking at conservation in terms of organic matter, he began looking at alternate crops such as grass, corn and grain crops. "Seeing those build up is sort of like the miracle of compounding interest," he says.

"Crop rotations contribute to shifts in diseases, rise of beneficial insects, depression or even change of weed species," explains Hardwick, whose operation is 100 percent continuous no-till. He says it took a series of years, and adjustments, to achieve success. "That's what is discouraging for a lot of people looking at no-till systems. Producers want a quick fix - forgetting that it took decades for the soil to deteriorate to this state."



Jay Hardwick seeks advice about conservation and agriculture from crop consultants, individual farmers, chemical companies, manufacturers, universities and CTIC, and encourages producers to seek out those in their area with knowledge.

Nothing to Chance: The Proof is in the Soil

Hardwick says what influenced his decision to manage for soil quality and build organic matter was the mountain of information about soils, their history and what effects they historically have had on great civilizations. "I was amazed by the experiment stations and the wealth of information and experience that was at my fingertips," says Hardwick.

Hardwick's message - "There is no single blueprint. It's a holistic approach that includes an entire view of the topography, the wildlife habitat, the tree species, weeds, grass, etc."

Both Bill Richards and Jay Hardwick are strong advocates of managing for soil quality. They are both willing to share their experiences. For a tour of Bill Richards' operation or to set up a field day, contact CTIC at (765) 494-9555.

For more information about Jay Hardwick and his operation, contact him at Tel.: (318) 467-5367 or E-mail: jay@louisiana-internet.net.



Advocates Work Where it Counts

Can Conservation Tillage Save Lives in Africa?

By Steve Werblow

International Conservation Series:

Conservation Here and Abroad



Top North American farmers can recite the benefits of conservation tillage and expound on their favorites, whether it's reducing erosion, protecting nearby streams and lakes, or reducing labor costs. But on sub-Saharan Africa's tiny subsistence farms – an acre or two, maybe three at the most, generally tended by a woman and her children – may stand to gain the most from conservation tillage.

la conservación

Conserving soil, moisture and precious energy is a life-or-death struggle in sub-Saharan Africa's depleted soils and a climate that alternates withering droughts with heavy storms. Dutch Gibson, a crop consultant with the Conservation Farming Unit of the Zambia National Farmers' Union (ZNFU) in Lusaka, Zambia, says traditional farming methods exhaust local soils in just five to seven years. At that stage, farmers prefer to move, cut down virgin forest, and continue the cycle. That's why Zambia has the fourth-highest rate of deforestation in the world, according to the U.N. Food and Agriculture Organization (FAO).

Just as bad, population pressure, the need to stay near urban markets, and, in many countries, armed conflicts keep farmers from practicing the slash-and-burn techniques that had allowed them to move to

new ground for millennia. As a result, many families are struggling to survive on depleted soils, often on hillsides or beside flood-prone rivers. Gibson figures that about half of Zimbabwe's land is too depleted of nutrients and organic matter to produce an economic crop. The percentage climbs to 60 or 70 percent in Malawi.

Beyond the immediate struggles pitting farmers against the environment lurks the specter of HIV/AIDS, which has as much as 30 percent of the population of some African nations in its grip. HIV weakens farmers, ultimately killing millions; meanwhile, surviving relatives have to take on the burden of feeding orphaned children.

In that unforgiving environment, ZNFU's Conservation Farming Unit director Peter Aagaard estimates Malawi's farmers move more than 600 million tons of soil per year by hand, one hoe's worth at a time. The ZNFU brochure that Aagaard wrote to promote conservation tillage emphasizes that most of the land preparation work is done shortly after harvest, when food is available and people have most of their strength.

New Approach

Typically, farmers in southern African nations – particularly as Zambia – clear their fields of crop residue, pile it up and burn it. They believe residue removal deprives pests of habitat and eases field preparation. But it's a task that takes weeks, eliminates ground cover and organic matter, and saps energy as the year's food supply dwindles. Aagaard and Gibson have been promoting a system of conservation tillage centered



"Saving soil" has extra meaning when conservation tillage can reduce weeks of hand labor. With his long-handled Chaka hoe, this Zambian farmer can quickly dig moisture-trapping basins.

around 8-inch-deep basins that trap scarce rainwater, break up hoe pans and create permanent, well-spaced planting spots for corn, beans, peanuts or cotton.

No-till proponents with a soft spot for new iron and clever downpressure systems take note: the most complicated piece of equipment in the ZNFU's conservation tillage kit is a Teren rope, a string marked with crushed bottlecaps at 70-centimeter (27.5-inch) intervals. Staked taut, the Teren rope indicates proper spacing of the basins; four strokes with a long-handled hoe is all it takes to dig one that's a foot long and 6 inches wide. At the end of the row, the farmer moves the line 90 cm (about 3 feet) and starts again. Manure is measured with soda pop cans; fertilizer and lime are metered with plastic scoops like the ones included in boxes of laundry detergent.

In all, conservation farmers can set up their basins in half to one-third of the time it would take to clear the field. Because



the work is done in the fall rather than the traditional spring clearing/planting operation, conservation tillage farmers can also begin planting after the season's first rain. Every day's delay after that rain costs 1.4 percent of the yield of corn, beans, peanuts and cotton, estimates Aagaard. Still, promoting the practice demands dedication from conservation tillage advocates.

In a scene familiar to farmers around the world, many African growers are skeptical of conservation tillage. It seems like a lot of management. They're afraid that pests – such as termites – could be attracted to crop residue and end up infesting the crop (they're not, says Aagaard; in fact, the residue keeps existing termite populations too busy to attack crop roots anyway). They balk at recommendations to keep 30 percent of their land in legumes, which are expensive to plant. And they're cautious about striking out in a direction so completely different from the way things have always been done. As a result, about three percent of Africa's arable land is currently conservation tilled.

However, after six years of ZNFU promotion, Aagaard estimates that 90,000 hoe farmers in Zambia – 14 percent of the total – have already adopted the system. Increased yields from the first year of adoption, reduced labor, and better crop performance in withering drought made many into believers, and the word has spread as far as Uganda and Mali.

Weed Revolution

Weeding is a vital part of conservation tillage in Africa, as in North America. But encouraging farmers to weed their fields in a timely manner is a hard sell – a farmer facing a hectare (2.47 acres) of 3-inch weeds is looking at 12 to 15 days of hard, tedious work for each round of weeding, or 50 to 70 days throughout the season. Aagaard and Gibson are vigorously promoting the use of

Roundup applied with a handheld wick applicator called a Zamwipe, which looks something like a kitchen mop and can reduce weeding time by 60 to 70 percent.

"We estimate that 70 million [person]-days are spent weeding by hand in Zambia every year," says Gibson. He is quick to add that a 15-year-old girl with the two-pound tool in her hand and a baby on her back can do the work of ten strong men with hoes. And at \$20, the tool is cheaper than hiring laborers, even at the low prevailing wage of 60 cents per day. ZNFU lobbied hard for Zamwipes, and the U.N.'s FAO invested in enough Zamwipes and Roundup to allow 2,600 farmers to treat their 1-acre farms.

Insecticides play a role in Zambia's conservation-tilled crops, especially cotton. In fact, Aagaard and Gibson promote strip cropping, which encourages crop rotation and takes advantage of spray drift from cotton to protect adjacent grains and legumes.

Extraordinary Results

Aagaard and Gibson point to study after study showing that conservation tillage offers substantially higher yields in good years, and greater security in dry years.

Field tests show that Zambian farmers' conservation tillage corn yielded at least 75 percent more than their conventional corn; cotton yields climbed 60 percent. A side-by-side trial by 205 Zambian farmers associated with the Cooperative League of the U.S.A., a nonprofit organization funded by the U.S. Agency for International Development, produced 3,000 pounds of corn per acre on conservation tilled ground. That's just 53 bushels per acre, but it's twice the yield they harvested from their conventionally managed ground. And a study of cotton

production showed an increase of nearly a bale per acre.

Perhaps the most striking contrast occurred in southern Zambia in the 2001-2002 season. Instead of the normal 31 inches of rainfall, the area received 16 to 19 inches, and 70 percent of the households suffered crop failure. Conservation-till farmers harvested their crops that year, a testament to the moisture-saving basins they had dug the previous fall.

Gaining Ground

Conservation tillage has gained support among government leaders and non-governmental aid organizations. And it's becoming increasingly popular with the small farmers Aagaard and Gibson are trying to help – in Zambia and other African nations.

"Our simple method is similar to traditional water harvesting techniques practiced for centuries in the dry Sahel," says Gibson, referring to the arid, drought-prone region below the Sahara Desert that extends from Senegal in the west to Ethiopia in the east. "The only difference is the precision we advocate and the attention to detail. These farmers are buying bicycles and building houses [with the profits they've earned through conservation tillage]. But the main benefit is that they have food for the year, and food to exchange for labor for field operations."



Ripping hoe pans or plow pans in dry soils is tough work, especially because most of Zambia's oxen have died of East Coast Fever. Efforts to sustain draft animals with cover crops may help encourage con-till adoption and better soil stewardship.



Louisiana Mastering Conservation

Core 4 Conservation fits with Voluntary Ag-Led Program *By Angie Fletcher*

More than 340 Louisiana stream segments are on the state's list of impaired waterbodies because they do not meet the established standards for oxygen, fecal bacteria and other pollutants. Because of this, Total Maximum Daily Loads (TMDLs) were established in the Mermentau and Vermilion-Teche basins in 1999.

"Louisiana producers face numerous concerns with the implementation of TMDLs," says Carrie Castille, Louisiana's Master Farmer Program coordinator. "TMDLs require reductions in non-point source pollution, and agriculture is considered one area targeted to meet the necessary reductions."

Facing this demand for nonpoint source pollution reductions, along with low crop prices and unpredictable weather, Louisiana producers were at a big disadvantage. In 2001, several state agencies joined forces to create the Louisiana Master Farmer Program. This program is both an education and implementation program designed to demonstrate that agricultural producers can and will voluntarily reduce the impact their operations have on Louisiana's environment.

"The Master Farmer Program is an agriculture-led effort to help producers make decisions on best management practices, because ultimately they will have the final decision on the practices they will implement," says Castille. "So it our job to educate the producers from an environmental, economic and production stand point as to what practices they should implement to benefit their farm and the environment."

Core 4 Conservation is a good fit with the Master Farmer Program. Castille explains, "In working with Natural Resources Conservation Services and Soil and Water Conservation Districts (SWCD), we looked at the Core 4 Conservation program and found that it is consistent with what we are doing with the Master Farmer Program. We have implemented Core 4 Conservation as part of the Master Farmer Program." Ultimately, the reception from producers is outstanding.

Voluntary vs. Regulatory

Dr. Ernest Girouard, rice farmer and chairman of the Vermilion Soil and Water Conservation District, became interested in the Master Farmer Program because it brings together the regulatory agencies that influence operational decisions farmers have to make. "It is a complete program that is entirely voluntary," says Girouard.

Within two years, more than 1,150 producers have participated, affecting more than 1 million acres of land. "We have farmers enrolled in 35 out of 64 parishes in Louisiana," says Castille.

Producers enrolled in the program progress through three phases of instruction and hands-on learning, receiving certificates of completion after each phase. (See sidebar for description of phases.) Ultimately, each producer will develop and implement a farm-specific comprehensive conservation plan addressing land-based natural resource challenges.

"The reason the Master Farmer Program is so important is that the end result is a documented Natural Resources Conservation Service-approved conservation plan stating that a producer is doing everything within his or her power to improve environmental quality," says Girouard.

Many producers in Louisiana are practicing conservation, but according to Girouard, this is not known by lawmakers or the general public. "Producers use Global Positioning Systems for applying proper rates of fertilizer, herbicide and pesticide, which reduces the amount of chemicals used in the fields," he says. "We are applying ounces



LSU Ag Center

Louisiana producers pack the training room in March 2003 to attend the first phase of the Master Farmer Program.

Nonpoint source pollution, such as agricultural run-off, is considered a leading cause of deteriorating water quality. Concerns over this prompted a multi-agency effort to form the Louisiana Master Farmer Program.

Master Farmer Program Partners

- LSU Ag Center
- USDA
- NRCS
- LA Dept. of Ag and Foetry
- Nat. Oceanic and Atmosphere Admin.
- LA DNR
- La. Dept. of Environmental Quality
- LA Soy Association
- Louisiana Cattleman's Association
- La. Rice Growers
- LA Farm Bureau
- Potash and Phosphate Institute
- American Sugar Cane League
- NACD



instead of gallons or pounds." These same producers are soil testing, grid sampling, precision applying chemicals, no-tilling and installing erosion prevention pipes following NRCS guidelines.

Girouard predicts that, "eventually, if we don't show that we are doing our fair share to clean up the streams and rivers, we are going to be faced with a regulatory agency telling us that we have to have a conservation plan. I prefer it to be voluntary. Many more people will comply that way."

Certifying Compliance

In May 2003, the Louisiana legislature passed Act 145, which certifies that producers who successfully complete the Master Farmer Program are in compliance with soil and water conservation requirements.

"This is a big incentive for producers," says Castille. The producers didn't just want their name on a roster; they wanted protection from regulatory action. "Our producers are proud to be going through the program," she adds. "It means they are certified in environmental stewardship and are taking on-the-ground steps that will make a positive difference."

Castille notes that it isn't just the producers, but the community as a whole, that is receiving the program well. "The environmental community is looking at the program and saying that what the farmers are doing is good for the environment," she says.

Another incentive for producers is the information they receive. A conservation planning fact sheet, written by state and local NRCS, SWCD and the Louisiana State University Ag Center, will be distributed to all participants. "It allows producers to feel at ease, and gives them some ownership in what they are undertaking," explains Castille.

Workshops are planned that will allow producers to ask questions of NRCS and SWCD personnel about individual

conservation plans.

"There are a lot of questions that need to be answered in response to conservation planning and implementation," says Castille. For example, is there a difference in the agreement with NRCS if the property is leased or owned?

"We have some very progressive farmers," says Castille. The first round of training included producers who were early adopters and leaders in the community. "It is crucial that we recruit respected producers when selecting the model farms."

Producers, not an agency, will share experiences with other producers in the phase two model farm component. "Producers, whose farms are selected as models, will be able to speak from experience about the economics of the operation, why they implemented the best management practices they did and what environmental benefits they received," says Castille. Producers will explain to fellow producers what costs they have incurred and what they have recouped in terms of less labor, inputs, time, equipment and stewardship benefits.

Facing staffing and timing challenges, coordinators are excited about the growth of the program. "This started as a pilot program and we have shown our success," note Castille. It is successful because it is not just an educational program, but an implementation program as well.

Castille receives calls weekly about expanding the program. Recently, a Memorandum of Understanding was signed with Arkansas and Mississippi to implement the program. In addition, discussions are ensuing to expand the program into the 13-state southern region. "We are willing to do whatever it takes to help states start their own programs, and we are

Master Farmer Program Phases

Phase 1

Producers attend classroom instruction on environmental stewardship related to water quality regulations, conservation practices and U.S. Department of Agriculture conservation funding.

Phase 2

Producers attend model farm field days, which include on-farm viewing of implemented, commodity-specific best management practices. Water quality monitoring stations will be installed to evaluate the effectiveness of these conservation practices.

Phase 3

Producers develop and implement farm-specific conservation plans in cooperation with Natural Resources Conservation Service Area Conservationists and/or local Soil and Water Conservation District offices.

sharing information," she says.

According to Castille, one advantage of the program is that it is a multi-agency program led by farmers. "So, one of the first things we did was solidify the partnership with both state and federal agencies," states Castille. This is the first step other states must follow. "We are willing to help sell and promote this to farmers nationwide," adds Castille.

"There is definitely great potential for a national partnership," says Castille. And, she envisions CTIC as a major partner in the program, "helping to promote environmental stewardship using the voluntary approach."

For more information about the Louisiana Master Farmer Program, contact Carrie Castille, Tel.: (225) 578-2906; E-mail: ccastille@agctr.lsu.edu; or Web: www.lsuagcenter.com/subjects/masterfarmer/. To register for the Master Farmer Program, visit www.lsuagcenter.com/subjects/masterfarmer/registrationpage.asp.



Improving Nutrient Management

Controlled Drainage may Increase Nitrogen Efficiency

By Jill Reinhart

Innovative technology may help conservation planners and producers with nutrient management. In the battle to stop nutrients from polluting streams and rivers, conservation planners typically recommend producers implement a nutrient management plan, including proper fertilizer application rates and timing. For producers, the fight is about saving money by preventing nitrogen loss. An emerging tool for drainage management, could give conservation planners and producers the winning edge to lessen environmental impacts and save money.

In agricultural systems with tile drainage, up to 90 percent of the water leaving a field is carried through tile lines. Because nitrate-nitrogen is

soluble, it can also move through the tile lines along with the water. By finding ways to control when and how much water leaves through tile lines, producers can better manage nitrogen. In Illinois, drainage management demonstration sites have yielded 40 percent annual reductions in nitrogen moving through tile lines, leaving the nutrient where the producer intended it, for the crop.

Flowing with Benefits

By using a control structure at the end of tile lines, drainage management works by allowing farmers to control the elevation at which water exits the tile drain system. The control structure can hold water back in the field

during the winter, or fallow season, and make the water available for crop during the dry summer months.

"In flat areas, we can achieve a water quality benefit by changing the outlet," says Don Pitts, a water quality specialist with the Natural Resources Conservation Service in Illinois.

"This is (also) a mechanism to achieve production benefits." The challenge for farmers, says Pitts, is learning how to maintain optimum water levels between the root zone and the tile line.

Adoption in Illinois began with about 40 demonstration sites, and about an equal number of structures have been established as a result of these demonstrations. "It's difficult for

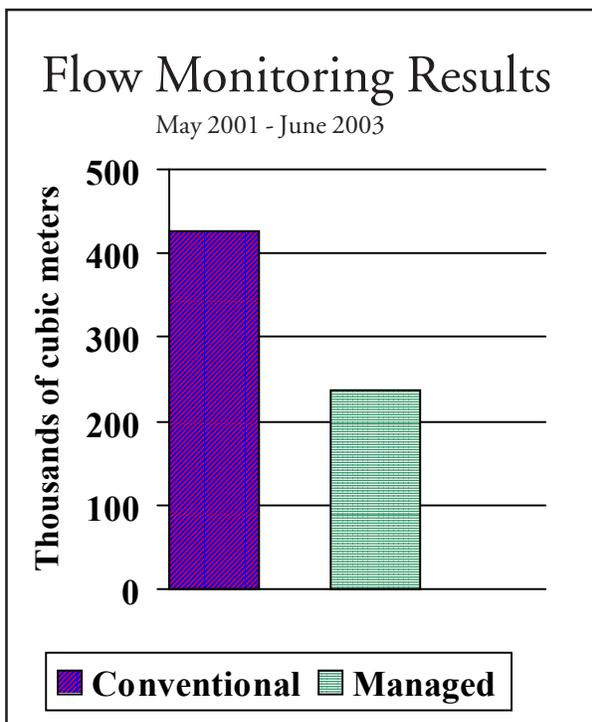
growers to take on a new practice just for the water quality benefits," says Pitts. In Illinois, NRCS has been providing an incentive for producers to try the practice by making cost-share funds available through the Environmental Quality Incentives Program (EQIP).

The average total cost to retrofit existing tile drainage systems has been about \$50 per acre. Gene Davis, NRCS district conservationist in Illinois, has been working with several producers who have installed the practice using EQIP cost-share funds. They are, "very pleased with what they did," says Davis, remembering one farmer's beans that got shoulder high in the first year. Another producer, however, hasn't seen an increase in yields after 2 to 3 years worth of data. Billy Voiles, a producer trying the practice, says that, "in time, as I learn to manage it properly, it will become a bigger asset."

"This practice fits best where tile grade is less than 0.5 percent," says Dan Towery, natural resources specialist at CTIC. Pitts agrees that the economical field size for this practice is still unknown, but feels there are environmental benefits anywhere tile lines are flowing. Pitts hopes to quantify the water quality and production benefits through monitoring efforts.

Drainage Push

A cross section of industry, government and academic interests have come together to promote drainage management through the Agricultural Drainage Management Systems Task Force (ADMS). ADMS is working to provide guidance and research to facilitate the adoption of drainage management technology. Wil Fontenot, an NRCS



Preliminary results of a flow monitoring study in Ford County, Ill., shows 44 percent less water leaving through tile lines in the field with managed drainage than the field with a "free" flowing tile drainage system. Nitrate concentrations were similar in tile water from both fields, translating into about a 40 percent reduction in nitrate loading to surface water as result of drainage management.



resource conservation specialist working with ADMS, explains that the practice is applicable anywhere there is tile or surface drainage, citing examples in Florida, California and North Carolina.

Another group promoting drainage management is the Agricultural Drainage Management Coalition (ADMC), which is a coalition of companies including The Fertilize Institute, the Land Improvement Contractors of America, Agri Drain and Ellingson Companies. Anne Keys, executive director of ADMC, explains that the coalition envisions managed drainage as one component of holistic farm management, combining the practice with comprehensive nutrient management planning, conservation buffers and grass

waterways. Because reductions in nitrogen levels are quantifiable, Keys also envisions the practice earning producers credits in nutrient trading programs.

For more information, contact Wil Fontenot, NRCS resource conservation specialist, Tel.: (337) 291-3098; E-mail: Wildon.Fontenot@USDA.gov; or Don Pitts, NRCS water quality specialist in Illinois, Tel.: (217) 353-6642; E-mail: don.pitts@il.usda.gov.

*Jill Reinhart is CTIC/
NRCS water quality specialist.*



This drainage control structure, manufactured by Agri Drain, is designed to be installed in the pipe line, so the water enters the pipe, then flows into the box, over the stoplogs, then out the downstream side of the structure. A handle is included on the metal lid to remove, install or adjust the stoplogs.

Partners Survey

Partners Magazine just got better. Now, we are making it available in two forms: printed, which is the form you have received for years; or electronic, attached to an email message.

Which do you prefer? Printed Electronic (print current email address)

In order to continue to provide useful information **to** you, we request information **about** you.

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3. Have you visited the CTIC website (www.ctic.purdue.edu)? _____
4. Which topics covered in *Partners* interest you most? _____
5. What topics would you like to see addressed in the future? _____
6. Is the information you read useful? _____
7. Do you share *Partners* with other people? If so, how many? who? _____
8. Do you know someone who should be a member of CTIC? Please tell us how to contact them. _____

Submit the completed questionnaire to Karen Scanlon, communications director, Fax: (765) 494-5969; or E-mail: scanlon@ctic.purdue.edu or visit www.ctic.purdue.edu/survey to complete the survey.

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Edible Soil Compaction Demo

By Cathy Myers

Soils that have been exposed to heavy equipment or a lot of human or animal foot traffic are usually more compacted. Compacted soils contain less air and/or water pore space than soils not subjected to a lot of weight.

If a soil does not have sufficient pore space, it is limited in its ability to function. Adequate pore space is essential for the movement of water, air and soil organisms through compacted soil. In addition, plant growth can be hindered because tender seedlings cannot grow through the soil very well. Roots cannot grow very well either; they become stunted and aren't able to absorb as much water and nutrients as a plant in soil with lots of pore spaces. Lack of sufficient pore space and the accompanying compaction also restricts water infiltration, resulting in excessive runoff, erosion, nutrient loss and potential water-quality problems.

Using cereal to illustrate particles/aggregates of soil and milk to imitate rainwater, the following edible experiment shows how compaction affects the infiltration, storage and rate of water movement through soils.

Required Materials

- 2 cups of chocolate sweetened rice cereal (e.g. Cocoa Rice Krispies)
- 2 clear containers (e.g. drinking glass or empty jam jar)
- rolling pin
- 1 cup milk (preferably whole milk, half and half or cream)
- 2 squirt bottles or measuring cups with pour spout

Directions:

1. Pour one cup of chocolate rice cereal into one of the clear containers. Place the other cup of cereal in a closeable plastic bag and roll with a rolling pin until approximately half of the rice cereal is crushed. Pour the crushed/compacted cereal into the second clear container.

2. Pour ½ cup of milk into each of two squirt bottles or measuring cups. Whole milk or cream is more desirable than skim or two percent milk because it is thicker and whiter, making it easier to see.

3. At exactly the same time and at the same rate, have one person pour a cup of milk over the compacted cereal and another person pour a cup of milk over the non-compacted cereal. Be sure to pour the milk into the center of the cereal so that the milk doesn't run down the sides of the container.

4. Compare the rate of milk flow through the two containers of cereal. How long does it take for the milk to reach the bottom of each container? Does the milk immedi-



When soils are compacted, such as the cereal in the glass on the left, rain water cannot infiltrate, which increases the chance for excessive erosion, slowed root growth, nutrient loss and possible water quality problems.

ately infiltrate (enter) the cereal or does it "perch" on top or part way down?

5. Repeat the experiment with new cereal and milk. This time crush/compact the cereal until few rice grains remain whole. How does this affect the infiltration of the milk? If this was water and soil instead of milk and cereal, how would this affect plant roots? Would the roots be able to grow very deep? Would there be much water available in the soil for the roots to absorb during the dry, hot summer?

For more information, contact Cathy Myers at E-mail: myers@ctic.purdue.edu or Tel.: (765) 494-1827.



From a crop production standpoint, the effects soil compaction has on water flow and storage may be more serious than the direct effect on root growth.



3rd Annual Core 4 Conservation Awards

These national awards recognize two innovative producers, who have realized economic and environmental benefits using the systems approach, and a Core 4 Conservation Alliance that helps create local-level conservation successes and advance the national Core 4 Conservation campaign.



Watch your mailbox!

Nomination forms will be mailed early 2004.

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Feature Member



IMC Global

IMC Global Inc., plays a prominent role in the production of the world's food supply. As a producer and seller of concentrated phosphates and potash fertilizers and animal feed ingredients, the company provides the international agricultural community with nutrients to nourish the land and animals that feed an ever-increasing global population.

How long have you been a member?

IMC has been a member from the early days of the Conservation Technology Information Center (CTIC). At that time, Dr. Sam Kincheloe served on the board and was quite involved in providing direction for some of the early programs.

What benefits have you received by being a member?

Our greatest benefit is the result of our single vision. IMC and CTIC both are committed to making growers profitable, while at the same time protecting the environment for future generations. The Core 4 Conservation marketing concept is strategically allied with our company commitment. We all agree that one of the best conservation practices is providing an environment whereby plants are healthy and provide cover for the fragile soil we all need to protect. This obviously improves water quality and assures a brighter future.

What has your membership provided CTIC?

Through our membership, we can provide a better appreciation to CTIC members and readers of the value of proper soil fertility management in protecting our environment.

In what ways could CTIC provide greater benefits to your organization?

CTIC can provide additional support by staying focused on a total conservation production system. Likewise, continuing to explore ways to become more national and diversified would be positive.

What would you like to see more or less of in *Partners Magazine*?

You do a good job of providing balance in your approach to stories. Again, stay focused on the impact of Core 4 Conservation on national trends.



Blacklands Conservation Technology Alliance

Summer crops have been harvested, and producers in the Texas Blacklands are discovering that this was not a very good year. A closer study shows that root systems growing in a tomahawk shape were greater in fields that were conventionally tilled than in no-tilled and strip-tilled fields. According to Charles Wade, Natural Resources Conservation Service, the problem is due to compaction caused by producers driving on wet fields and because of the lack of organic matter.

Conservation tillage paid off this fall when much of the area received 8 inches of rain. No-till and strip-till fields had very little erosion, while conventionally tilled fields had lots of sheet, rill and gully erosion. Wade says, "It will take a long time and lots of money to repair some of these fields. The valuable topsoil that was lost can never be replaced." Conservation tillage not only saves topsoil but it requires fewer inputs than conventional tillage, and less machinery and labor.

Plans are underway to make a video of conservation tillage tools for the Texas Blacklands next spring. Plans are being made to have a Conservation Tillage Conference next spring.

For more information about the BCTA, contact Charles Wade, NRCS at Tel.: (254) 697-3692 or E-mail: charles.wade@tx.usda.gov.

Indiana

The Owen County Soil and Water Conservation District was awarded an Environmental Protection Agency Section 319 Grant to implement the Core 4 Conservation program in three watersheds in Owen County, Indiana. Gwen Dieter, district coordinator, wrote the grant proposal to Indiana Department of Environmental Management last year and it was awarded to



Earl Worland, pork producer on the right, and Bruce Finkbiner, Natural Resources Conservation Service, will be working in Worland's watershed, along with two others, trying to replicate the success of past Core 4 Conservation projects in Owen County.

the District Oct. 1. The Soil and Water Conservation District Supervisors will administer the project.

The three targeted watersheds are located in southwest Owen county encompassing 32,455 acres that drain into the Lower White River, which has been added to the state's list of impaired waterways.

The purpose of the Core 4 Conservation Initiative Project will be to develop and implement a cost-share program (75 percent grant/25 percent participant) to install best management practices that demonstrate the effectiveness of the Core 4 Conservation program and work as a system to achieve *Better Soil, Cleaner Water, Greater Profits* and a *Brighter Future*.

For more information, contact Bruce Finkbiner, NRCS, Tel.: (812) 382-4472 or E-mail: bcf53@yahoo.com.

Lower Little Red River Watershed Alliance

Sixty local landowners attended the Lower Little Red River Watershed Alliance meeting, which was facilitated by CTIC staff on Sept. 25. At the meeting an interim board was elected for the alliance and three committees, finance, outreach and nominations, were formed. The leaders and committee members are meeting to outline how the Alliance intends to improve the watershed.

Several Alliance members have been busy installing streambank restoration techniques such as cedar tree revegetations. The Alliance held a streambank tour and workshop Oct. 25.

For more information, contact Shawn Burgess, NRCS, E-mail: shawn-burgess@ar.nacdn.org.

No-Till on the Plains

The eighth annual No-Till on the Plains Winter Conference, scheduled for Jan. 26-27 in the Bicentennial Center, Salina, Kan., is for beginners as well as advanced no-tillers. There will be speakers from several states and countries discussing the benefits of no-till, as well as 60 sessions available to choose from. More than 60 exhibitors participate in the very popular tradeshow portion of the two-day event.

No-Till on the Plains, Inc. (NTOP) publishes *Leading Edge*, a magazine that provides the latest, most up-to-date information on no-till four times a year. The first two issues are available on the NTOP website, and CDs of past issues are now available for sale.

For more information on the upcoming winter conference, contact Program Coordinator Brian Lindley at Tel.: (888) 330-5142 or visit the website at www.notill.org.

Ohio Agricultural Environmental Assurance Alliance

Critical review of the second draft of the environmental self-assessment materials was the primary purpose of the Ohio Agricultural Environmental Assurance Alliance Steering Committee meeting on Oct. 30. The Alliance is working closely with state Natural Resources Conservation Service staff to ensure that the environmental self-assessment program and the Farm Bill Conservation Security



Program are coordinated. The Alliance's goal continues to be to conduct three pilots of the environmental self-assessment program in December 2003.

A promotional brochure and display for the Alliance has been produced. The Alliance is in the process of obtaining signatures on a letter of understanding to formalize membership. All of the steering committee members have committed to sign on and become formal members of the Ohio Agricultural Environmental Assurance Alliance.

For information about the Ohio Agricultural Environmental Assurance Alliance or the Environmental Self-Assessment Program, contact Larry Antosch, Tel.: (614) 246-8264 or E-mail: lantosch@ofbf.org.

Owyhee Watershed Council

The Owyhee Watershed Council's video, partially funded by a Core 4 Conservation Alliance grant, is complete. The video, approximately 28 minutes in length, focuses on the history and future of conservation in the upper and lower regions of the Owyhee River Basin.

The Jordan Valley Rodeo Board donated funds to aid in the distribution of the video to the public. To date, more than 100 copies of the video have been distributed, as well as made available at the Malheur County Soil and Water Conservation District's meeting and the annual Jordan Valley Rodeo.

The educational committee is working with the public broadcasting station to air the video on a local television station, as well as working to create a curriculum to introduce the video into the classroom. Also, the Malheur County Commissioners have expressed interest in showing the video at the county courthouse on a regular basis.

For a copy of the video or to find out more about the Owyhee Watershed Council, contact

Jennifer Fenwick, Tel.: (541) 889-2588 or E-mail: jennifer-fenwick@or.nacdnet.org.

Tri-State Strip-till Alliance

The Tri-State Strip-till Alliance is holding its annual fall review Dec. 9 at the Irrigation Research Farm, in Yuma, Colo. from 9 a.m. to noon. A soup and sandwich lunch will be served. The final results of the 2003 long-term strip-till comparison plots and the second year of the Limited Irrigation Study will be presented. According to Mike Petersen, Natural Resources Conservation Service, most growers will be pleasantly surprised how the strip-till plots performed. Strip-till out-yielded the conventional-till corn by over 30 bushels per acre.

The strip-tillage concept is gaining strength in eastern Colorado, western Kansas and Nebraska. Early indication is that in 2004, there will be at least a 25 percent increase over the number of acres strip-tilled in 2003. Growers are considering the cost savings, easier management and savings of water and erosion. "It's just what the doctor ordered," says Petersen. Agronomists, consultants and conservationists in the Tri-State region report that strip-till acres numbered between 155,000 and 200,000 in 2003. Add 25 percent to that and the future of the western Corn Belt looks *Brighter* yet! Core 4 Conservation is alive and well.

For more information, contact Mike Petersen at Tel.: (970) 330-0380 or E-mail: michael.petersen@co.usda.gov.



Alliance Grants Available

Core 4 Conservation Alliances are public/private partnerships that help producers design and implement a system of agricultural practices that meets both production and conservation needs. These grants are available to help alliances create the local-level successes that advance the national Core 4 Conservation campaign to realize *Better Soil* and *Cleaner Water* for our environment, *Greater Profits* for agriculture and a *Brighter Future* for all of us.

Alliances in all regions of the country are encouraged to apply for grants of up to \$2,500 from the Conservation Technology Information Center (CTIC), which coordinates the Core 4 Conservation campaign. These grants will be awarded to qualified alliances based on the application guidelines. Grantees must provide a dollar-for-dollar match with non-federal funds. In-kind services are acceptable as match.

To apply, submit an application and all relevant information describing the alliance and its support of Core 4 Conservation to CTIC by Jan. 7, 2004.

Contact Cathy Myers, by E-mail: myers@ctic.purdue.edu or Tel.: (765) 494-1827 or visit www.ctic.purdue.edu/CTIC/GrantApplication.pdf for a grant application.



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Calendar

January

Jan. 23-25

The Practical Tools and Solutions for Sustaining Family Farms Conference, Gainesville, Fla.
Contact: Toni McLaughlin, Conference Publicity Coordinator, P.O. Box 154, Zachary, La. 70791; Tel.: (225) 654-2017; Fax: (225) 654-2017; E-Mail: ssawgconf@bellsouth.net; Web: www.ssawg.org.

Jan. 11-14

2004 Water Sources Conference, Austin, Texas. American Water Works Association. Web: www.awwa.org/conferences/sources.

Jan. 26-27

Eighth Annual No-Till on the Plains Winter Conference, Salina, Kan. Contact: Brian Lindley, program coordinator, Tel.: (888) 330-5142 or Web: www.notill.org.

Jan. 30

Call for Proposals for Best Education Practices for Water Outreach Professionals, Madison, Wis., University of Wisconsin. Contact: Kate Reilly, E-Mail: ktreilly@wisc.edu or Web: www.uwex.edu/erc/waterbeeps.

February

Feb. 1-5

NACD 58th Annual Meeting, Waikoloa, Hawaii. Contact: Trindal Stanke Aboud, NACD, 509 Capitol Court NE, Washington, DC 20002; Tel.: (202) 547-6223; Fax: (202) 547-6450; E-mail: trindal-stanke@nacdn.net; Web: www.nacdn.net.

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.



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