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Report on USDA Water Quality Projects in Michigan

Michigan State University Extension Service

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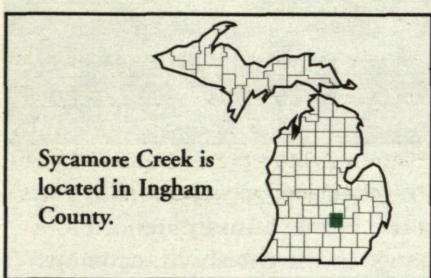
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REPORT ON USDA WATER QUALITY PROJECTS IN MICHIGAN

Sycamore Creek Water Quality Project Is A Model



To what extent will cover crops contribute to the environmental quality of the Sycamore Creek watershed? That's the focus of field trials on several farms within the watershed. A MSU crop and soil sciences technician recently talked with Mason area farmers on how cover crop interseeding in corn reduces herbicide and fertilizer inputs and cuts labor and fuel costs while preventing soil loss.



The Sycamore Creek watershed in west central Ingham County consists of 67,738 acres laced with creeks and streams that contribute surface water to the Grand River, which empties into Lake Michigan.

The watershed is 21 percent urban — south Lansing, Holt and Mason — 62 percent agricultural, 12 percent forestland and 3 percent wetlands. Two percent consists of streams, ponds, lakes and gravel pits.

According to Teresa Miller, Extension project coordinator, the focus of educational activities begun in 1990 in the watershed is primarily on agricultural and non-agricultural non-point source pollution — a diffused pollution stemming from a variety of sources such as construction site runoff, home lawn and garden and agricultural fertilizer and pesticide use, and sedimentation due to soil erosion.

Cooperators in the project include Ingham County MSU Extension, the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the Ingham County Department of Health's Bureau of Environmental Health, and others such as the Michigan Department of Natural Resources, USDA Consolidated Farm Service Agency (CFSA), formerly ASCS, and the Ingham Conservation District.

A significant portion of the watershed's residents are not directly associated with agriculture but are interested in home gardening and landscaping. Consequently, the watershed education program also contains outreach to homeowners and gardeners. It includes:

- ◆ An on-going shortcourse series, "The Environmentally Friendly Gardener," that promotes reduced use of fertilizers and pesticides on lawns and landscapes and in gardens.

- ◆ Community gardening leadership training for Lansing community garden leaders that promotes use of non-chemical gardening practices and community leadership development.

- ◆ Workshops for home gardeners on safe, economical, non-chemical alternatives to fertilizers and pesticides for flowers, fruits and vegetables.

Youth-oriented projects include the annual 4-H and Urban Options stenciling "Dump No Waste - Drains to Stream" on storm drains throughout the Sycamore Creek watershed. The point is to warn residents about the effect of pouring used motor oil, paint and household chemicals (a

common practice) into storm drains that directly enter the watershed, Miller explains.

"The population mix and diverse land use that we have over the watershed dictates the wisdom of a multiple outreach to area residents, although our primary mission is in improved agricultural practices since agriculture accounts for the greatest land use," says Jack Knorek, former Extension agricultural agent with the project.

According to Brian MacMaster, water quality specialist for NRCS, the role of NRCS and the Ingham Conservation District is to provide

technical assistance to land users to help maximize productivity and maintain sustainability while in harmony with a healthy land and quality environment.

The NRCS works directly with over 100 farmers operating within the watershed, to help implement "best management practices" (BMPs) to reduce soil erosion and improve water quality.

"Over 20,000 acres of farmland are under conservation tillage," MacMaster said, "This, in conjunction with the land user's ecosystem-based management plans, has reduced the sediment entering the Sycamore Creek and its tributaries by a potential 46,000 to 50,000 tons per year."

These same farmers are targeted by Ingham County MSUE with workshops, tours and field trials that focus on BMPs that reduce the use of synthetic pesticides and fertilizers: cover crops, alternative weed controls for atrazine, management intensive grazing, manure management and reduced fertilizer rates. These practices can maintain or increase farm profitability while enhancing environmental quality. In addition, Ingham County MSUE provides an equipment calibration service (e.g., manure spreaders, pesticide sprayers) to reduce the over- and underapplication of crop protection chemicals and animal wastes.

"Growers work with pesticides, fertilizers and the soil almost every day of their lives, and they, more than anyone else, are looking for new products or practices that will make their business safer, healthier and more environmentally friendly. I think we sometimes are not fully aware of the degree to which that desire is commonly found on the farmstead," he adds.

That interest becomes evident in the numbers of farmers that participate in the annual Sycamore Creek Water Quality Program Farm Tour, which reviews on-going field demonstrations that involve area farmers.

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Projects Sparked Farmer Participation and Agency Cooperation

The impetus for increased stewardship of agricultural lands within three watersheds in Michigan followed on the heels of the Water Quality Initiative in 1989.

The first was the 67,738-acre Sycamore Creek watershed, followed by the 48,000-acre Wolf Creek watershed and then the Saginaw Bay Water Quality Demonstration Project. The latter consists of about 535,200 acres, most of which is in cropland.

The projects were embarked upon jointly by Michigan State University Extension Agriculture and Natural Resources (ANR) programs, the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) and the USDA Consolidated Farm Service Agency (formerly Agriculture Stabilization and Conservation Service).

Mark Hansen, MSU Extension ANR programs, says that the decision on which watersheds to focus upon was made by the three lead agencies in collaboration with the Michigan Department of Natural Resources, the Michigan Department of Agriculture and other agencies.

"Together we reviewed the key watersheds in the state, then prioritized them according to need," Hansen says. "We also took into consideration a number of other factors including the availability of experienced personnel in each watershed from participating agencies."

While portions of Ingham and Lenawee counties are included in The Sycamore Creek and Wolf Creek projects respectively, the Saginaw Bay project includes four counties. The bulk of that project is located in Huron and Tuscola counties with a smaller

portion in Saginaw and Bay counties. The Sycamore Creek project has completed its fifth year (and received a three-year extension) and the other two watersheds will complete their five-year duration in Sept. 1995.

Hansen says that overall, the projects have provided an opportunity to introduce new technology from MSU and elsewhere to Michigan agriculture and to foster innovative environmental stewardship practices among enterprising farmers.

Ruth Schaffer, water quality specialist at NRCS, says, "In several instances, the outreach by the three lead agencies [MSU, NRCS, CFSA] attracted the guidance and cooperation of non-agriculture groups, such as the local department of health in the Sycamore Creek watershed and cities of Adrian and Onsted in the Wolf Creek watershed. This is a good example of how government often works effectively with the farmer to attain a common goal."

Bob Payne, program specialist at CSFA, says that one of the most successful aspects of the water quality projects has been the farmer participation in the SP53 (also known as The Integrated Crop Management Program).

"It has been quite successful in helping growers try out new ideas, refine crop management practices and encourage them to think in terms of a systems approach to their overall farm operation," he says.

He adds that in many cases, the project has taken to the farm many new environmental management ideas that will continue to broaden to the benefit of the grower and the environment for years to come.

Sycamore Creek (Continued from page 1)

The 1995 tour focused on reduced fertilizer use, environmentally safe hog carcass composting and the benefits of cover crops in coarse grains to suppress weed growth and improve soil fertility, and reduced nutrient applications on soybeans.

Voluntary financial incentive programs, such as the Water Quality Incentive Program (WQIP) admin-

istered by CFSA, have been critical to the success of the Sycamore Creek Water Quality Program. Cost-share monies provided through CFSA encourage farmers to try new farming practices. Many of the practices pioneered within the watershed, such as integrated crop management, are now being adopted throughout Ingham County and the nation.

Winter production meetings and the periodic publication "The Watershed" reflect the results of projects that focus on the benefits of soil testing, nitrate testing in the spring, fertilizer sidedressing (as opposed to field broadcasting), trimming if not eliminating use of starter fertilizers and soil insecticides, pesticide application based on insect

scouting and the benefits of livestock rotational grazing.

"The effectiveness of the project has been due to the enthusiasm of local agricultural producers, as well as the coordinated efforts of the agencies involved," Miller says. "We are very pleased with our progress to date."

Demonstration Farms Lead the Way

Bernia Farms proudly proclaims their participation in the Saginaw Bay Water Quality Demonstration Project.



As the USDA Saginaw Bay Water Quality Demonstration Project name implies, one goal of the project is to demonstrate how water quality best management practices can fit into a successful farming operation. In 1992, Ron, Jeff and Scott Bernia of Akron, in Tuscola County, agreed to serve as a demonstration farm for the project. They worked together with MSUE, NRCS and CFSA to develop and follow a conservation plan and implement a number of practices. A sign announced to those passing on M-138 that the farm was participating in the Saginaw Bay Water Quality Demonstration Project and

that they were taking an interest in keeping their Saginaw Bay "Agriculturally Crystal Clear." The Bernia farm was included in several producer and agribusiness tours over the past three years.

Practices integrated into the Bernia operation include soil sampling and nutrient management, IPM, farmstead assessment evaluations, tillage practice including the use of row cleaners on the planter, and cover crops.

"The row cleaners do a good job of moving the rye cover crop out of the row at planting," says Scott.

Switchgrass and alfalfa filter strips were established along drains, and wind samplers were installed to measure the effect of various tillage and conservation measures on soil movement.

Other research plots on IPM and nutrient management showed the economic feasibility of these practices. Scott figures that they have reduced their phosphorus rates by 30 to 50 percent over the past few years. Jeff has become a certified pest scout.

"Scouting helps us with timing our pesticide applications to make them

most effective," says Jeff. IPM plots on the Bernia farm influenced a change in the threshold recommendation for leafhopper on young dry beans. Scott is also working with MSU's nutrient management computer software to develop a nutrient and pesticide record-keeping system for their operation.

The Bernias were concerned farmers before becoming involved with the water quality project, but as a demonstration farm, they have been able to expand and adjust their cropping system and have integrated several practices that continue to protect the environment.

FARM*A*SYST is Helping Farmers Protect Farmstead Water Quality

The Farm*A*Syst (FAS) program is a set of fact sheets and worksheets that farmers and rural residents can use to help improve groundwater and surface water stewardship.

The worksheets help landowners examine practices such as septic system maintenance; pesticide, fuel, silage and fertilizer storages; and livestock, milking parlor and household hazardous waste disposal.

In 1993, MSU Extension in Huron County started using the FAS program in support of the Saginaw Bay Water Quality Initiative. To date, the Huron County FAS has reached approximately 2,000 people through crop producer workshops and other agricultural events, special grade school environmental programs, media outreach and other public activities.

Though Sally Comer, MSU Extension program associate, promoted FAS in Tuscola, Sanilac, Bay, Saginaw, Gratiot, Isabella and Clinton counties, she focused most

of her efforts in the past project year in Huron County, where she is based.

The Huron County FAS was featured in a national broadcast via satellite that updated viewers on the progress of the FAS program in the United States and on the Canadian version of FAS in Ontario.

Comer also worked on the closing of 13 abandoned wells in Huron County in cooperation with Jerry Fischer, district conservationist with The Huron County Natural Resource Conservation Service (NRCS), and Dale Lipar and Cindy Carson, Huron County Health Department.

"Last year's program has led to the Huron County Soil Conservation District participating in Michigan's Groundwater and Freshwater Protection Program," states Fischer. "Thirty additional wells are targeted for closure in 1995."

The Huron County FAS also collaborated with the Michigan Department of Agriculture, using

the EPA-funded "Operation Clean Sweep" to collect 6,821 pounds of outdated pesticides from 82 farmers in Huron, Tuscola and Sanilac counties.

During the 1994 project year, Comer completed 52 one-on-one on-site assessments with 47 farmers and five non-farm rural residents. Through agricultural meetings, Comer taught another 620 people how to use the Farm*A*Syst worksheets.

Comer found that, though most of the rural residents support groundwater and environmental protection programs, farmers are not eager to invite strangers onto their property to conduct FAS assessments.

The success of the program hinges on how comfortable the farmer feels with the person doing the assessment, Comer says.

"If there is a question about confidentiality or if the farmer doesn't feel good about the person helping with the assessment, chances for

participation are low," Comer says. She also says that it is important not to overwhelm the farmer with too many sections of the FAS assessment at a time.

"Farmers need to be given time to feel their way along with the program," Comer adds.

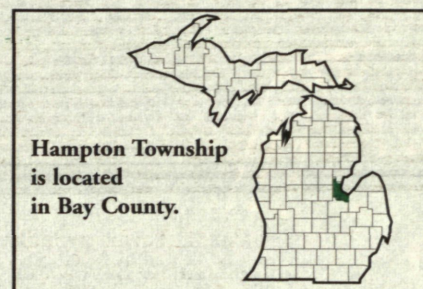
It is also important to have readily available solutions for any problems the FAS assessment finds on the farm.

"We cannot afford to do an assessment and leave the farmer with frustrations," she says. "If the assessment is important, then we need to provide answers that are economical and/or show them where help may be available that will allow them to make improvements, especially if the needed changes are costly."

"There also has to be a mutual commitment built into the program," she says. "If there is no commitment by those responsible for conducting the program, the farmers will sense it and little will be accomplished."



Always conscious about what storms and high winds blowing across Saginaw Bay can do to fragile potato ground, Duyck uses a custom-built rig that tills the soil only in the row in which potatoes will be planted, leaving a cover crop intact between the rows to reduce potential soil loss.



Growing Potatoes by the Bay Using Good Stewardship Practices

David Duyck of Hampton Township, near Bay City and just a few miles from Saginaw Bay, is ever conscious of the potential for contamination of surface water from his and neighboring farms.

The area where he farms is laced with deep drainage ditches. Their water level fluctuates — sometimes water overflows the ditch banks — according to the winds and storms affecting the bay.

Duyck's is a third-generation operation that covers more than 450 acres and produces 280 acres of Atlantic and Snoden potatoes (used in making potato chips) rotated with corn, soybeans and wheat.

"One of the basic things we do is regular soil testing, following MSU recommendations to minimize as much as possible the potential nutrient loading of groundwater and, especially, our surface waters," Duyck says.

All fertilizers used are banded in the row at planting, and subsequent nitrogen applications are divided to maximize plant uptake of the nitrogen during the growing season.

Because potatoes need consistent moisture for optimum growth, Duyck's irrigation system annually applies about 7 inches of water to the crop (depending on the amount of rainfall received) under the guidance of technicians who monitor soil moisture.

"We follow an irrigation scheduling program that takes into account rainfall received, previous irrigation, how much moisture the crop has absorbed, temperature history, humidity readings and the evapo-

transpiration rate," Duyck says. "This helps us reduce the chance of nutrients escaping below the crop root zone."

The entire irrigation system has been evaluated and all of the nozzles have been calibrated to assure a uniform water application.

"We also use professional pest scouts and apply insecticides only when the economic threshold is reached," he says. "So we benefit two ways — one is timing the application when it is needed, and we can be sure that we won't use the insecticide when the infestations are not above the threshold level."

To minimize insecticide requirements, Duyck uses a propane flamer drawn behind his tractor to literally burn the insects from the emerging plants.

"There is a limited time we can use the flamer in the spring — about seven days — but in the fall, we add a few more burners to the unit and broadcast a flame across the potato hill," Duyck relates.

According to Mike Staton, MSU Extension agent, the flames kill the potato vines (saving the use of a chemical to kill the vines, which must be done before harvest) and destroys most of the potato beetles that would otherwise overwinter to attack next year's crop. Duyck says this is two to three times cheaper than using chemicals.

He also uses plastic-lined trenches along the borders of his fields to trap potato beetles. Duyck says this has substantially reduced insect pressure and consequently reduced the use of costly insecticides, to which potato beetles are becoming resistant.

As a rule of thumb, good potato ground is characteristically sandy and consequently vulnerable to wind erosion, especially near the bay, where strong winds are common.

"On our potato ground, we fall plant rye to protect the soil until spring, and then we use a strip tillage tool [of his and a neighbor's making] to work up the potato row," Duyck relates.

The planting process seeds potatoes into 36-inch rows with a 14-inch-wide strip of rye between the rows. When the rye is sufficiently tall, it is killed with a herbicide. The residue continues to prevent erosion through the growing season.

"As one of three demonstration farmers in the Saginaw Bay Water Quality Demonstration Project, Dave has been a real leader and innovator in applying conservation to the land," states Chuck Lightfoot, NRCS project coordinator and district conservationist.

Duyck has installed erosion control structures at the field drain outlets,

which he has modified to trap soil particles.

"It's similar to the flood irrigation gates used in Arizona, although we built ours in such a way that soil particles settle out into a trap before the water reaches the ditch," Duyck says. "They work very well and are easy to maintain."

Duyck says that these practices are important to him economically and environmentally.

"There is always going to be room for improvement, but we feel we are not only well within the constraints of the law but that we are using good land management practices that are compatible with environmental expectations," Duyck says. "That's important to us."

He credits the Saginaw Bay Water Quality Project and SP53 (also known as the Integrated Crop Management Program) for several of his new practices. The program reduced the economic risk of trying new ideas and helped him improve his chemical use and soil erosion control management.

(L to R) Staton, Duyck and Lightfoot examine one of the field drains that Dave has modified to help trap sediment that might otherwise be carried by surface water to a drainage ditch.



Precision in this Operation Goes Right Down to the Seed



The change from standard to narrow-row planting produced so much crop residue that Dodak had to rebuild his conservation tillage equipment to handle it adequately. Shown here with Steve Poindexter (right), MSU Extension agricultural agent in Saginaw County, Dodak says that with Poindexter's help, soil erosion from the farm has all but disappeared.

Climbing aboard Lee Dodak's four-wheel drive tractor is like entering an airplane cockpit. The tractor cab is crammed with a computerized monitoring system that allows Dodak to know precisely how much chemical, seed and fertilizer is being used at planting.

His combine is also equipped with sensors that monitor grain coming into the bin practically to the seed (if he starts hearing a lot of "pings" on the monitor, he knows the combine is losing grain through the sieves or out the back end), and his grain wagon is fitted with a scale that helps him track per acre yields at harvest.

Though he winces at the term "technology farmer," he does like being able to know and document exactly what is being done in his farm environment.

His goal is to maximize his crop yield to the extent that, in a decade, he will have netted the equivalent of an extra harvest — free.

Dodak is a second-generation farmer who manages a 2,000-acre corn and soybean rotation on the edge of the Saginaw Valley Watershed.

Although Dodak's farm is not in the Saginaw Bay Demonstration Project area, he has observed project activities and made changes on his own farm as a result.

Underlying his zest for precision farming is a solid concern for safeguarding the environment, a value instilled in him by his father's example.

"I can remember as a kid seeing my dad, when he was planting, come

across a killdeer's nest and stop the tractor, move the nest to the side, pass through, then move it back again," Dodak says. "He'd say there is a reason those birds are here and he'd take care of things like that. It was just brought down through the years — take care of what you've got."

Another factor driving his interest in precision is the variability of the ground he farms. It's on the southern edge of the glacial outwash that created Saginaw Bay and has a pattern reminiscent of chocolate ripple ice cream.

"I tell people that we have everything here from concrete to blow sand," he quips. The soil type can change from clay loam to sand in the space of a few rods.

The advent of the guidance systems on his equipment is the result of deciding to plant his crops in 22-inch rows rather than the standard 30-inch row, figuring that it was wiser to bolster per acre yield than buy more land, at least for now.

Dodak credits Steve Poindexter, MSU Extension agricultural agent for Saginaw County, with helping him to make the change.

"Our field trial yield data show a gain of 10 to 13 bushels per acre from planting corn in 22-inch rows rather than 30-inch rows," Poindexter says. "Rather than waiting to gain a bushel per year with just variety improvement, producers can increase yields the equivalent of 10 years by going to the narrow rows."

Having decided on narrow rows, Dodak needed a suitable planter for his operation. He didn't find exactly

what he needed, so he decided to build his own.

Building the rig led him to install seed and fertilizer monitors and radar that allows precise application of crop chemical sprays according to field conditions.

"The spraying monitor will quickly pay for itself. I think every farmer should have a monitor on the tractor when they are spraying," Dodak says. "You've gotta know exactly what you are doing in today's agriculture, and with the system that I've got, there is little if any opportunity for mistakes.

"When I'm planting, I can monitor the number of seeds and the amount of fertilizer that is being placed in the soil every foot of the way, and when I cross some of that really sandy ground where I'd like to change my seeding rate and adjust the fertilizer requirement accordingly, I can make those adjustments from the tractor cab, on the go," he relates.

Dodak's seeding rate for corn runs about 28,000 plants per acre and for soybeans, between 136,000 and 142,000 plants per acre, depending on soil type and yield goal.

The application of chemicals is based on scouting reports on weed and insect development. He tests soils regularly and does nitrate testing in corn each year, following MSU fertilizer recommendations and using the services of a local fertilizer dealer.

All of the cropping and harvest activity in the field is tracked in the computerized farm record system.

"If you don't have good records, you don't know where you've been and you may not know exactly where you're going when it comes to the next step," Dodak says.

That next step will more than likely be farming by satellite — site-specific farming.

"Lee has a plan for where he wants to go, and the monitoring systems he has on his equipment will adapt to global positioning," Poindexter says. "He's following a logical sequence and not trying to do it all at once."

Poindexter says that the "management package" that Dodak has put together for the farm has essentially eliminated wind and soil erosion from his cropland.

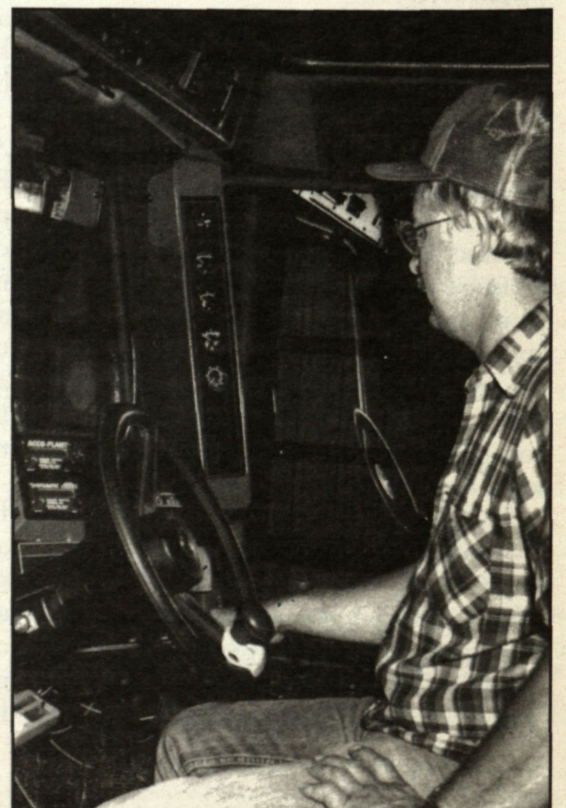
"In fact, our residue has become so heavy that we had to modify our chisel plow because it would get plugged up in a few yards, but it's worked out well," Dodak says. "I always hated being out in the field and seeing sand in the ditch. Happily, we don't have much of a problem any more."

Dodak says that long-range planning, taking advantage of available new technology and trying to stay a step ahead of environmental regulations is sometimes daunting but worth it.

"Farming is getting so complicated that in this day and age, systems for analysis are critical for long-term success," Dodak says. "There's a sign in my farm shop that says 'A Clean Place Is A Safe Place', and that's the way I feel about managing the soil. If I do a good job now and my kids do a good job when they take over, this farm will be around for a lot of years."



Surrounded by sensors, read-out panels and other monitoring devices, Lee Dodak knows exactly how his planting, pesticide application and harvesting equipment is performing in the field. He can also adjust his equipment "on-the-go" as field conditions dictate.



Huron County's Innovative Farmers Focus on Improving Area Surface Water Quality



Jim LeCureux (far left, pointing) MSU Extension agricultural agent in Huron County, talks with growers about conservation tillage of sugar beets. The stop was part of the 1994 Innovative Farmers of Huron County integrated cropping systems plot tour of 80 acres rented by the group to test a range of crop planting and tillage systems. The goal of the group is to develop a "more economical, efficient and environmentally sound agricultural industry in Huron County."

An outgrowth of the U.S. Department of Agriculture Saginaw Bay Water Quality Demonstration Project is the Innovative Farmers of Huron County (IFHC), officially organized in January 1994.

The group currently consists of 46 farmers and 32 commercial sponsors, including community lending institutions, elevators, equipment dealers and other farm supply businesses.

IFHC arose from a 1991 W.K. Kellogg Foundation three-year grant to develop sustainable agricultural practices in Huron County.

The 46 growers who pay a \$100 annual membership fee to belong to IFHC represent about 5 percent of the county's farm operators and 12 percent of the tillable land. The largest farm consists of more than 6,000 acres of cropland; several others exceed 2,000 acres each.

Huron County is among Michigan's top 10 agricultural counties (based on 1992 statistics) for the production of many commodities.

To help maintain or increase the county's agricultural viability, the goals of the IFHC are to:

- * Promote research that will make Huron County's agricultural industry efficient, economical and environmentally sound.
- * Aid in the development and expansion of new technology to neighboring farms.
- * Increase awareness and educate the public on current agricultural issues and trends.
- * Provide a forum for discussion on agricultural and environmental issues.

"We have one of the longest shorelines in the state and almost the entire of our watershed drains into Lake Huron or Saginaw Bay," relates Jim LeCureux, Huron County MSU Extension agricultural agent, the originator of IFHC. "We know that we have to substantially curtail, if

not stop, wind and water erosion to improve water quality yet be able to continue to grow high value crops such as sugar beets and dry beans in a cropping rotation of sugar beets, corn, dry beans and soybeans."

In the past several years, LeCureux has worked with farmers on projects such as collecting water samples from field tiles to determine the amount of nutrient leaching, field grid sampling to trace fertilizer movement and field experiments with cover crops to prevent wind erosion.

NRCS involvement with the IFHC has been in the area of erosion control and prediction. "We have set up wind erosion devices and a snow fence at one site in the county to study wind erosion on these heavy soils. After snow samples were analyzed, the different management techniques showed a dramatic difference in suspended solids, phosphate and nitrogen forms," stated Jerry Fischer, District Conservationist with NRCS in Huron County.

In addition to these on-farm crop and water quality management demonstrations throughout the county, IFHC has rented two 40-acre demonstration sites for five years for an integrated cropping system demonstration. At these sites, some 14 miles apart, four basic crop tillage systems are being compared to determine which system is the most profitable and environmentally permissible, given the county's heavy soil.

Along with the yield and economic evaluations being collected from the growth trials at the two demonstration sites, soil quality measurements (carbon/nitrogen ratio, organic matter and biomass) will be taken to determine the amount the soil quality changes in response to the various tillage systems being used.

An offshoot of the demonstrations, which include soil incorporation of livestock manure, may be a manure-brokering network that will enable livestock producers to distribute manure to cropland that can use the nutrients when their own lands have

had sufficient application. John Porath, CFSA county executive director, states that he is seeing some significant changes in farming practices throughout the county since the IFHC group was established.

"When SP53 started taking off in Huron County, the Innovative Farmers group seemed to naturally evolve," he said.

"The success of these projects to date is that we have 46 farmers who have identified water quality and the environment as a concern and are willing to work together to solve that concern," LeCureux says.

"None of our farmers have the time or the money to experiment and change the system on their own, but collectively they can draw on their respective experience and knowledge and make changes," he adds.

LeCureux says the value of having agribusiness members in IFHC is the knowledge and understanding they can gain about the value and challenges facing the county's agriculture.

"I don't think a farmer can change on his or her own — the banker has influence, the spouse has influence, as do the fertilizer people and the equipment dealers," he says. "So what we are trying to do is bring everybody together here so we are all learning and changing at the same time, because if one of these people makes a wrong recommendation to the farmer, the system may be ruined."

Past and planned leadership sessions between the farmers and the non-agricultural community have opened discussions that revealed the lack of understanding between the two groups.

"It helps the farmer to understand that there is a conflict of opinion about agriculture and that they need to do a better job of explaining the challenges of their profession," LeCureux says. "At the same time, non-farm people begin to learn about the economic value of agriculture and the effort that the farming

community is making to protect the environment.

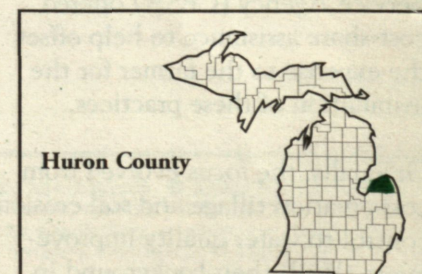
"We're trying to bring together people who we have not traditionally worked with Extension," he says. "Normally we just had meetings for the farmer and the farmer went out the door and we figured we had taught him everything we knew. But we didn't think about all the other people who influence that farmer — and they need to be brought along at the same speed, and that's what we are trying to do with this program."

The other points LeCureux says the non-farm community needs to understand are that conversion from conventional to conservation farming does not happen overnight and that when changes do occur in farm management, they are largely based on economics.

"Everyone who is driving this call for change has to understand that it is going to take time for a farmer to make a change in environmental management," he says. "We need to work together to understand that and maybe come up with some programs to help the farmer make that transition.

"The other thing we are trying to do is get the farmer to be an active participant in this change rather than a passive learner," he adds.

"Farmers need to go out into the non-farm community and voice their opinions and also start a dialogue with environmental groups so they can find out that our producers are real people," LeCureux says. "These farmers and their families use the bay and lake waters just like everyone else and they don't want to see them destroyed any more than anyone else. You won't find a more active environmentalist than a farmer!"



Wolf Creek Watershed, Lenawee County – A History of Cooperation

John Garrison (right) was one of the first producers in the Wolf Creek watershed to convert his cropland to no-till management. Here Garrison, shown with Brian Ehlert, MSU Extension agriculture agent, reviews Integrated Crop Management practices for improved nutrient management.



The focus of the multiagency collaborative effort on the 48,000-acre Wolf Creek watershed in Lenawee County is to curtail the annual deposit of an estimated 6,700 tons of soil sediment in Lake Adrian. With a population of about 22,000, Adrian is one of the few cities in the state that rely on an inland lake for a large portion — about half — of its residential drinking water.



Adrian city officials, according to Brian Ehlert, MSU Extension agriculture agent in Lenawee County, estimate that more than 25 percent of the lake's volume has been displaced with soil sediment since 1963.

Interest in the Wolf Creek watershed began in the mid-1980s, when the Lenawee Soil and Water Conservation District (SWCD) applied for a special grant through the Michigan Department of Agriculture. About \$300,000 were used in the watershed to provide incentive funds for the application of conservation practices that reduced sediment entering Wolf Creek and, ultimately, Lake Adrian. In addition, a water quality database was established upstream from Lake Adrian, from 1987 to 1990, to identify nutrient, sediment and pesticide loading, along with total flow.

The early focus of the Lenawee SWCD and the Natural Resources Conservation Service (NRCS) was conservation tillage, especially no-till, along with grassed waterways, water and sediment control basins, and diversions. To encourage farmers to install and maintain these practices, the Consolidated Farm Service Agency (CFSA) offered cost-share assistance to help offset the expense to the farmer for the installation of these practices.

Gradually, the focus evolved from conservation tillage and soil erosion control to water quality improvement. With their background in

watershed work, these conservation partners, along with MSU Extension, pursued additional USDA funding. Incentive payments were made available to interested landowners and farmers to make changes in crop management that would improve water quality.

Today, more than 300 farmers in the watershed reduce soil, nutrient and chemical runoff from agricultural lands by cooperating with MSU Extension, NRCS, CFSA, the city of Adrian, the Lenawee County Health Department, the U.S. Geological Survey, the Lenawee Soil and Water Conservation District and agribusinesses in the county.

Land use within the watershed includes 28,320 acres for production of field crops and hay. Another 330 acres is in pasture. Almost 10,000 acres consist of woodlands, with lakes and streams occupying 2,420 acres. Urban development occupies 1,890 acres, and another 3,510 are classified as "other."

Among the earlier adopters of conservation tillage is cash crop grower John Garrison, who for the past 32 years has managed more than 500 acres in Cambridge Township. Garrison also custom plants and harvests another 400 acres in the community each year.

Garrison's operation is one of the farms at the headwaters of Wolf Creek, which drains into Lake Adrian. Along with other creeks and streams, this flows into the Raisin River and eventually into Lake Erie.

"I was one of the first to try no-till when it was introduced to this area in 1981," he says. "The land around here is rolling and erodible and I've always been interested in reducing erosion and the amount of pesticides we use, so whenever something new comes along, I'm interested in trying it out."

Working with Tom Van Wagner, NRCS district conservationist, Garrison developed a conservation plan for his farm, which included conservation tillage, pasture and hayland management, use of cover crops, crop residue management and grassed waterways.

"Everything on my farm is now no-till," he says. His equipment lineup now includes a 15-foot Great Plains no-till drill, a six-row Kinze planter set up with Rawson coulters and a strip-till attachment.

The transition from conventional tillage to no-till enabled Garrison to reduce equipment power requirements and labor.

"We had a four-wheel drive and that's gone, along with all of the equipment it used; the biggest tractor we have now is 120 horsepower and we don't use it that much except for planting corn," he relates. "Our labor requirement and fuel consumption have also dropped considerably. The way the operation is now, I could easily run 1,000 acres or more myself, if I had to — that's how much we've cut our requirements."

Garrison says that it took about three years to master the new management required by no-till farming.

"I don't know of a grower who hasn't experienced it," he says. "There are problems you have to overcome with the hybrid variety you plant because no-till requires a harder seed. When you can plant is also different from conventional farming — you've got to stay off the soil when it is wet.

"You also have to learn to alter your time of planting and the way you plant because the soil takes longer to warm in the spring for suitable seed germination," Garrison says.

"Cover crops work well in controlling erosion, but they do create a problem in taking available moisture away from the crop if you don't manage well," Garrison says. "You've also got to pay a lot more attention to your soil fertility and micronutrients because they change considerably after a few years of no-till."

In spite of the higher degree of management required, Garrison says the results are worthwhile.

"We have a lot of 9 and 10 percent slopes on this farm, and since I've gotten into no-till, we don't have any more erosion — we just did away

with it," he says. "The water-holding capacity of the soil has increased and we have much better crop stands over the clay knobs of the fields because of the residue that is on the surface."

Garrison says that he doesn't know of any grower in his area who would go back to conventional tillage once they've tried no-till and that he is quite confident that agriculture has made some significant progress in stemming soil erosion in his area.

Garrison significantly reduced erosion through no-till, then he established grass waterways and filter strips to provide further protection of surface waterways and water quality. Filter strips will filter sediments and reduce, by about 50 percent, the amount of sediment which may otherwise reach a water body.

Ehlert says that many of the other producers in the watershed are emulating Garrison's conservation practices and that several are helping to monitor surface water quality.

"We all felt that evaluation of the watershed project would be very difficult without any baseline surface water quality data," Ehlert says. "Local producers are collecting tile samples, and one of our growers installed a Coshocton water wheel at his farm to collect water samples from several crop demonstration plots."

The results to date show that levels of sediment, phosphorus and pesticides have fluctuated greatly, mainly in correspondence with rainfall levels. Although there seems to be a downward trend in surface water loading, more testing is warranted.

Ehlert says that producers are also participating in nutrient reduction practices through SP53, following MSU fertilizer recommendations, testing for soil nitrate levels in corn to limit nitrogen applications, participating in on-farm reduced pesticide use trials, and using MSU's guidelines for manure nutrient testing and proper land application.

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This Grower Likes Incentives Such as SP53 and Special Programs That Help Reduce the Risk of New Ideas

Fred Gottschalk manages 1,300 acres in Huron County's Mead Township that produce wheat, corn and dry edible beans.

He is enthusiastic about his membership in the Innovative Farmers of Huron County and about environmental stewardship incentive programs such as SP53, which he says nudge him into different ways of thinking about soil and crop management.

The SP53 program was piloted through the U.S. Department of Agriculture Water Quality project and was institutionalized in 1994 because of the number of farmers interested in the program.

"Fred Gottschalk refers to the SP53 program as one of the best and most innovative programs that CFSA has cost-shared in years," says John Porath, County Executive Director of Huron County Consolidated Farm Service Agency.

"A decade, even five years ago, the emphasis most of the time seemed to be mainly on getting more crop production per acre, and there didn't seem to be an overriding concern about the

effect on the environment," Gottschalk says.

"At the time, we didn't really understand why some soils performed better than others," Gottschalk relates. "But when programs like the SP53 came along, it made us look at the way we farm in a little different manner."

He says that a few years ago, the standard answer to problem fields was to apply more fertilizer without understanding good soil management.

"Now we've found that just throwing on more fertilizer wasn't necessarily the answer. In our case, we've been able to eliminate our phosphorus applications by changing our soil management so that the phosphorus is more readily mineralized for crop uptake, and we haven't seen a decline in yield," he relates.

Gottschalk says that growers generally lack the knowledge of how to make environmental improvements rather than the desire.

"Incentives and cost-share programs help us try new manage-

ment ideas without undue economic risk," he says. "We want to make improvements but it costs money to make changes, and if those changes are required without sufficient learning time on our part to reduce risk, we may not be able to afford them."

He is a little ambivalent about the future.

"In the 25 years that I've been farming, I feel that I know less about farming and what I am going to do in the upcoming year than I ever did," he relates.

"There are so many changes coming and different ways of managing the soil and environment that it is very confusing.

"Yet I want to be part of that because I want to leave something for the next generation and perhaps for the next 100 years," Gottschalk says. "However, I still have to make a living and I have to keep my risks as low as possible. If I have a program or incentive to help me do that, I'm quite certain I can make environmental progress and still be economically viable."

Gottschalk says that programs such as Farm*A*Syst (FAS) help

him think more critically about his environmental management. He has completed three units — on wellhead protection and fuel and pesticide storage.

"I'm interested in seeing the correct changes made, but in many cases, agriculture is going to need some help and some mutual cooperation in total management of the environment," he says. "It isn't just the fellow out working the ground — it's the person spraying pesticides on his lawn, also. We need broad community participation to do a good job with the environment. It's not up to just one group to do this, yet many times, if we work together to help a few individuals, all will benefit from a much cleaner environment."



The manager of more than 1,300 acres of cropland that produces wheat, corn and dry edible beans, Fred Gottschalk has completed three units — fuel and pesticide storage and wellhead protection — of the Farm*A*Syst program in Huron County. Shown with Sally Comer, FAS coordinator, Gottschalk says that incentive programs such as SP53 allow him to try new idea for environmental management without undue economic risk.

Wolf Creek (Continued from page 6)

He is impressed with the changes that growers have made in land management during the past two decades.

"Agriculture is changing and it has been keeping up with the times — it never has been static," Ehlert says. "It uses the new technology and always will, but I at times worry that the perception that off-farm people have about agriculture is outdated by 20 or more years.

"My concern is that, unless the public and policymakers have current knowledge about agriculture, we may end up with regulations that could overly complicate agriculture," Ehlert says. "We have to be careful not to focus on just agriculture for our soil and water quality problems — we need a much broader collaboration in addressing those problems."

In spite of the pervasive conservation farming within the watershed, surface water quality has not improved significantly since the mid-1960s.

One reason may be the influx of non-farmers into the countryside,

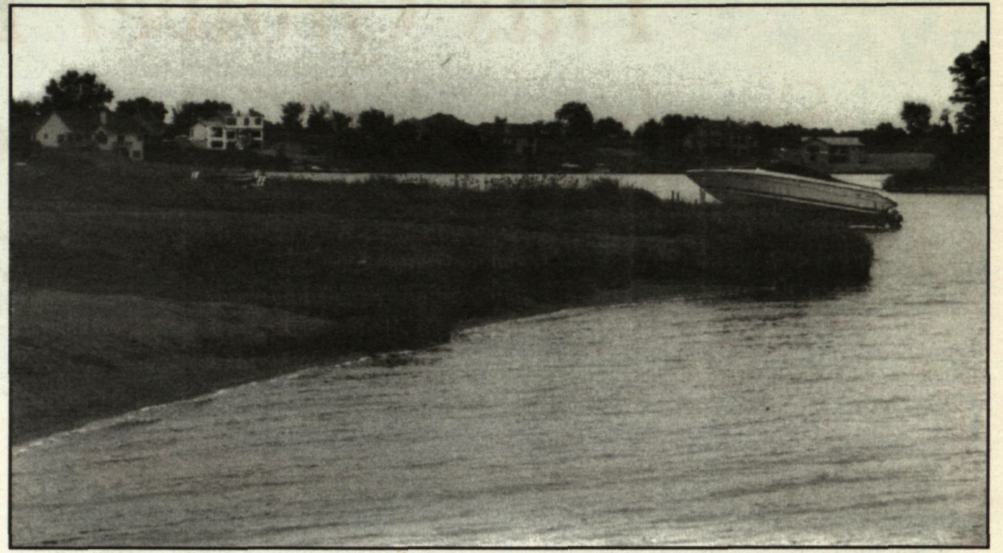
many of whom are attracted to the shorelines of numerous lakes — there are 25 of them, natural and man-made, in Cambridge Township alone — that are scattered across the farmland throughout the watershed.

Garrison says that during his term as a township supervisor, between 30 and 50 non-farm residences were being built each year in the township.

Ehlert says the influx has raised the suspicion of surface water nutrient and sediment loading from the land surrounding many of these homes.

The suspicion is strong enough that Ehlert has been able to persuade the Loch Erin Property Owners Association (LEPOA) to join in a water quality demonstration project. Loch Erin is a 43-acre manmade body of water that is part of a chain of 14 lakes that ultimately drain into Lake Adrian.

Loch Erin, 12 feet deep at its lowest point, is having problems with weed and algae growth that were non-existent five years ago. The lake is lined with houses, lawns that are fertilized regularly and hundreds of



Wave action from wind and recreational boaters is causing shoreline erosion on some parts of Loch Erin in Lenawee County. NRCS and MSU are assisting The Loch Erin Property Owners Association in trying out new shoreline protection techniques.

septic tanks, according to Ehlert. The LEOPA project consists of water sampling and testing, development of educational materials for lakeside residents and erosion control demonstrations using native plantings — trees, shrubs and cat-tails — while deemphasizing the use of sea walls, riprap and concrete for shoreline protection.

"We know there are surface water problems stemming from non-farm

residential development throughout the watershed," Ehlert says. "Our goal is to create the same awareness about the importance of good water quality protection practices among non-farm property owners as we have in the agricultural community."

Environmental Stewardship: Teamwork & Balance

A large part of Michigan's success in addressing water quality concerns in agriculture is due to the strong concern for good environmental stewardship between agencies and other groups. At the local level, this has included agribusinesses, farmer organizations, local health departments, city councils and even 4-H. Within the Sycamore Creek Water Quality Project in Ingham County, 4-H youths were involved in a drain stenciling program. Many of the drains in the city of Mason flow directly from the curb to the creek. The Extension agriculture and natural resources agent in Ingham County and local project coordinator initiated the project. The drains were stenciled with the words "DRAINS TO RIVER, DUMP NO WASTE". Extension and others are working to reduce the dumping of used motor oil, paints and other materials that can contaminate surface water.

In Huron County, an Innovative Farmers group was formed to address water quality in the Thumb area. A significant group of producers and agribusiness representatives are all working toward the same goal — refined farming practices that will not only protect the environment, but also lead to economic savings for the farmers.

In Lenawee County, the Natural Resource Conservation Service (NRCS—formerly Soil Conservation

Service), and the Lenawee Soil and Water Conservation District have worked with the local MSU Extension office for years to address erosion and sedimentation in the Wolf Creek watershed. District conservationist Tom Van Wagner and others involved in the projects have worked with Heidelberg College to perform water testing, with the city of Adrian on sedimentation concerns in Lake Adrian, and with the city of Onsted in experimentation with tree plantings and cover crops to lessen soil erosion.

Mark Hansen, Extension Program Leader with MSU Extension, says that there are also concerns for environmental stewardship at the state and national level.

"While this would be expected among our agencies, various individuals have gone way beyond the call of duty to make these projects successful," says Hansen. "We have a working group at the state level that consists of MSU Extension, NRCS and CFSA. When we discuss future directions, past accomplishments or challenges in the projects, we do so with both the producer and the consumer in mind."

Ruth Shaffer, Water Quality Specialist with the USDA NRCS, stresses the need for such inter-agency coordination at both the state and local levels.

"Water quality programs must be dynamic. They require feedback and adjustments and continued communication. But the payoffs are worth it. Shared resources and expertise can advance the efforts of all partners further than individual resources allow," she says.

Along with MSU Extension and NRCS, a third partner on the USDA team is the USDA CFSA.

"Our agency takes the lead in providing financial assistance to participating farmers," states Bob Payne, Program Specialist with CFSA. "In recent years, cost-share assistance has been directed to water quality practices and special project areas. This has been a critical factor in helping farmers adopt innovative practices which help in protecting water quality."

In addition to the three lead USDA agencies, several state agencies are also active in the project. The Michigan Department of Agriculture, the Michigan Department of Natural Resources (MDNR) and the Michigan Association of Conservation Districts work with the USDA agencies to identify areas of the state that need attention.

"Using a joint planning approach is important when proposals are submitted to Washington," says Hansen.

"It shows that we are working as a team, while also making sure that we are addressing the right areas."

At a recent USDA Water Quality Conference in Kansas City, Michigan was recognized for its strong ties to other agencies at the state and local levels. Deborah Allen, from the Surface Water Quality Division Nonpoint Source Program of MDNR was invited to participate as a panelist at the Kansas City conference because of her involvement in Michigan's projects.

"Michigan has shown good cooperation between USDA, local agencies and the MDNR in selecting water quality projects, coordinating funding, and conducting water quality monitoring," she says.

Hansen stands firm that there must be a balance between the needs of both farmers and consumers. "Yes, we need to be aware of how farming practices impact ground-and surface water, but we also need to keep the farmers in business if we plan on having a bountiful food supply in this country. That means continuing to examine how we farm and introduce new techniques that are environmentally conscious and yet cost efficient."