MAUMEE RIVER
REMEDI ALS ACTION PLAN

From Satellites to Earthworms:
Improving Farm Management

Final Report for the Lake Erie Protection Fund
Small Grants Program - SG 41/96

MAUMEE River
REMEDI ALS ACTION PLAN

Toledo Metropolitan Area
Council Of Governments
300 Central Union Plaza
PO Box 9508
Toledo OH 43697-9508
[419] 241-9155

December, 1996

This document was prepared by the Toledo Metropolitan Area Council of Governments with funding from the Lake Erie Protection Fund, member local governments, and by grants from the U.S. Environmental Protection Agency, through the Ohio Environmental Agency.
From Satellites to Earthworms: Improving Farm Management
Final Report
December 31, 1996

A workshop to address changes in the agriculture industry using the latest technological breakthroughs and to demonstrate successful conservation practices took place at the Bowling Green FFA test plots on Tuesday, August 27 from 4:30 p.m. - 8:30 p.m. More than 100 people attended, representing a varied audience, including dozens of farmers from Wood, Ottawa and Henry counties.

This was a very successful event. Coordinated by the Maumee River Remedial Action Plan Implementation Committee (MRIC) and the Wood County Con-Till Club, this public meeting addressed:
- No-till management practices for corn
- Improved nutrient management systems
- Global Positioning Systems technology
- Successful long-term no-till corn, soybean and wheat rotations
- Multiple benefits of long-term no-till management to improve earthworm populations and soil structure

One highlight of the night was an earthworm hole demonstration. Nontoxic smoke was blown into field tile and escaped through the earthworm holes. This demonstration was an example of how earthworms improve aeration, drainage and soil structure. It also illustrated the benefits of no-till farming, as plowing is not conducive for healthy earthworm populations.

Experts from around the Midwest gave presentations throughout the evening. Speakers included: Greg Willoughby, Purdue University; Frank Gibbs, Natural Resources Conservation Service; Dan Kaminsky, Helena Chemical Company; Fred Vetter, Wood County farmer; Jim Carter, Wood Soil and Water Conservation District; Dan Frobose, Wood County Extension Agent; and Peter Thomison, Ph.D., OSU Agronomy Dept. A meal was part of this program paid for through the Lake Erie Protection Fund grant.

In addition to the contributions received from the Lake Erie Protection Fund, other contributors through direct donations or in-kind services include:

Conservation Action Project
Wood County Con-Till Club
Wood Soil and Water Conservation District
Natural Resources Conservation Service
Ohio Department of Natural Resources
Bowling Green FFA
OSU Extension
LG Seeds
MidWood, Inc.
Luckey Farmers
CIBA Crop Protection
Ohio EPA
TMACOG

From conversations with attendees, this program was of great benefit for landowners. The evening further promoted the agenda of the Maumee Remedial Action Plan's Agriculture Runoff Action Group which is to promote best management practices on farm fields.
FROM SATELLITES TO EARTHWORMS: IMPROVING FARM MANAGEMENT
SG41-96

PROJECT EXPENDITURE REPORT

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Salary</td>
<td>$984.15</td>
</tr>
<tr>
<td>Fringe Benefits</td>
<td>326.27</td>
</tr>
<tr>
<td>Conference Expense</td>
<td>2,005.45</td>
</tr>
<tr>
<td>Printing Costs</td>
<td>1,933.15</td>
</tr>
<tr>
<td>Postage</td>
<td>349.17</td>
</tr>
<tr>
<td>Supplies</td>
<td>329.76</td>
</tr>
<tr>
<td>Overhead/Indirects</td>
<td>1,094.65</td>
</tr>
<tr>
<td>Other Expenses</td>
<td>13.75</td>
</tr>
</tbody>
</table>

Total Expenses           $7,036.35
August 16, 1996

Contact: Bob George, Wood Soil and Water Conservation District - 352-5172
Jim Rickenberg, Natural Resources Conservation Service - 352-5172
Jenny Carter, TMACOG - 241-9155 ext. 125

FOR IMMEDIATE RELEASE

From Satellites to Earthworms: Improving Farm Management

BOWLING GREEN, OHIO - New strides are continually being made in the agriculture industry using the latest technological breakthroughs. A workshop to address these changes and to demonstrate successful conservation practices is planned to take place at the Bowling Green FFA test plots on Tuesday, August 27 from 4:30 p.m. - 8:30 p.m.

Coordinated by the Maumee River Remedial Action Plan Implementation Committee (MRIC) and the Wood County Con-Till Club, this public meeting addresses:

- No-till management practices for corn
- Improved nutrient management systems
- Global Positioning Systems technology
- Successful long-term no-till corn, soybean and wheat rotations
- Multiple benefits of long-term no-till management to improve earthworm populations and soil structure

One highlight of the night will be an earthworm hole demonstration. Non-toxic smoke will be blown into field tile and will escape through the earthworm holes. This demonstration shows how earthworms improve aeration, drainage and soil structure. It also gives a great visual showing the benefits of no-till farming, as plowing is not conducive for healthy earthworm populations.

Experts from around the Midwest, including Purdue University, are scheduled to speak throughout the evening. A free meal from Harlan’s BBQ will also be provided to the first 125 people. This program is sponsored by a grant from the Lake Erie Protection Fund through the Ohio Lake Erie Commission.

MRIC’s Agriculture Runoff Action Group is working with several organizations on this program to further promote best management practices on farm fields. This group was formed to reduce agriculture runoff into the Maumee River and Bay ecosystem. Not only are they trying to keep valuable topsoil on fields, but they are also trying to keep it out of the waterways. Sediment impairs habitat and clogs the shipping channel and the attached nutrients fertilize aquatic vegetation which eventually reduces dissolved oxygen.

The Maumee RAP is partnership between federal, state and local governments working with area citizens to restore the health and beauty of the Maumee Bay ecosystem. The Maumee RAP is locally coordinated by, and a committee of, the Toledo Metropolitan Area Council of Governments (TMACOG).

###
Photos of Earthworm Hole Smoke Demonstration
Extremes in farm management help bottom line

By JULIE CARLE
Sentinel Farm Editor

Farm management today may be as simple as taking care of earthworms or as complex as using satellites.

Farmers are looking at both extremes when it comes to improving yields and their bottom line. Neither one can be forgotten, completely in light of the other.

Earthworms — nightcrawlers — to be more exact — are at the low end of technology, providing an important resource in agricultural soils, said Greg Willoughby, a Purdue University graduate student in agronomy.

In sharp contrast is the use of Global Positioning System to help farmers identify locations in fields for accurately pinpointing yields, soil fertility and drainage problems.

Both ends of the farm management technology spectrum were discussed at a recent farm management program. The program, "From Satellites to Earthworms: Improving Farm Management," was coordinated by the Maumee River Remedial Action Plan Agri-

The high-tech Global Positioning System, commonly called GPS, is becoming an oft-talked about subject for farmers these days.

Dan Kaminisky of Helena Chemical said his company decided to invest in the system because of customer demand. He admitted the technology is guaranteed to change before it is determined, but he has been pleased with the system and its ability to aid in soil sampling, yield monitoring and assessing soil fertility. "If we can do soil sampling and yield monitoring together, we can go in and assess the field," Kaminisky said.

"We will start stacking information, taking his yield maps and put them into a layering system. We may even be able to tell some things about heredities," he added.

Wood County farmer Fred Vetter started using a Global Positioning System last fall through a grant program. He got involved with the GPS grant through his participation in test plots using the Soil Doctor infrared monitoring system.

"I've been following GPS technology all along, but the technology is changing so fast," he said. "I know if I didn't jump in, I might miss out. It didn't seem to be five or six years ago for my mapek.

GPS helps farmers map out their fields using satellites to mark their locations in the fields.

The key, according to Vetter, is having several years of crops to say on top of one another and compare yields from year to year. He said it will take five or six years. Local farmer Dick Dauer, who has had some fields mapped by Veetor, said he would feel more comfortable with eight or nine years of information. Instead of just several years of data, he would like to see information from several crop rotations.

One of Vetter's concerns is the issue of what maps belong to "I want to own those maps," Vetter said. "When the farm sells, does the buyer want to buy them? Or when you farm 50-50, whose maps are they? That will be the issue.

The technology may not yet be perfected, but Kaminisky said, "We know it's coming, we just don't know how fast." Vetter assured, "It's not that far.

At the other end of the farm management technology spectrum is the importance of earthworms.

The lowly worm is important because of its association with healthy, productive soils, said Purdue's Willoughby. He believes farmers need to be paying attention to earthworm populations in their fields.

Nightcrawlers are especially important because of their ability to increase water infiltration into the soils. Surface-dwelling worms, such as redworms and fishworms, help mix the soil, increase pore space and increase nutrient availability and root growth.

Farm management practices become an issue for earthworms because "we are also managing the habitat in which earthworms live," Willoughby said.

The most harmful practice to earthworms in tillage, he said. Nightcrawlers, which create vertical burrows up to 50 or 6 feet deep, depend on crop residues for their food sources. If their residues are turned into the earth, that food source is depleted. Also, Willoughby explained, tilting may cut into a nightcrawler's burrow, causing the worm to create its residence elsewhere.

Crop rotations also benefit earthworms by adding valuable organic matter, especially when legume crops are part of the rotation. Though the presence of earthworms seems to signify healthy soil, there is no explanation why some fields that have been in no-till for years remain devoid of earthworms, Willoughby said. "That just proves how little we really know about earthworms."

A "seeding" process can be used with some degree of success, he said, "but it's an imperfect science with a 30 to 50 percent mortality rate."
Can you dig it? Earthworms are now latest farm technology

BY JANE SCHMUCKER
BLADE BUSINESS WRITER

Hailed as one of the latest technological breakthroughs in agriculture — on the same agenda as satellites and complex soil tests at farmer meetings — is the earthworm.

The lowly worms that fascinated Charles Darwin in his research in the late 1800s seem like they'd be a topic as old as dirt to area farmers. Not so. On many Midwestern farm fields, earthworms took up residence in numbers only in the past 10 or 12 years, after the plow was put out to pasture.

Just as farmers notice more benefits of the earthworm, agricultural colleges and research stations are studying the worm anew. Ohio State University, aided by more than $3 million from the U.S. Department of Agriculture and the National Science Foundation, keeps 15 to 20 people on worm projects.

At Purdue University, graduate students' best bet for stipends from the agronomy department is worm research.

Ivan Myers remembers the day he and a seed salesman were tromping through his corn fields. The salesman had never heard the sucking sound of earthworms slithering back into their burrows as they felt the vibration of people approaching.

Mr. Myers, who has spent many of his 71 years on farms, had never heard worms until he bought equipment that could plant a crop without first tilling it about 14 years ago. Without annual destruction of their homes by plowing, the worms thrived, making the soil look richer and feel looser than before, Myers said he's ever seen.

"Earthworms are the best people you have working for you for nothing," said Mr. Myers, who farms with sons Bill and Bob.

The Myers' value the earthworms on their 300 to 500 acres near Maumee Bay State Park that on the rare occasion when a field must be plowed, the work is done late at night when darkness will protect the worms from hungry seagulls.

Earthworms act almost like little plows in the ground, loosening the soil so it is easier for farmers to pull equipment through their fields. They also help reduce damage that heavy farm implements do to the soil.

Many of the large tractors on area farms weigh 18,000 pounds. Combines with a bin of corn can weigh 20,000 pounds. Grain cars can be more than 40,000 pounds when full.

That weight, along with the pulling force that it takes for a tractor to move a drill or planter through the ground, can squeeze soil particles together. The problems are worse when farmers work in wet fields.

But when earthworms live in...
Meanwhile, as the population ages, the $1.5 billion toothpaste industry is working hard to convince consumers that a perfect smile depends on healthy gums. Marketers are swamping back to an emphasis on therapeutic claims after a long period of pushing whiteners and other cosmetic attributes. (Dentists discount the efficacy of such popular additives as baking soda and peroxide. Fluoride, however, is an acknowledged cavity preventer.)

Gingivitis develops when unremoved plaque irritates the gums, making them swell and bleed. If untreated, diseased gums may shrink, eventually causing bad breath and tooth loss. Toothpaste makers say most adults get gingivitis at some point in their lives.

Underscoring the importance of the gum-care market, Colgate has been declining and now stands at 28.1 percent, a five-year low.

Colgate's share, meanwhile, rose 0.4 point to 18.8 percent during the year ended June 30, according to Information Resources, Inc., a Chicago firm that tracks consumer spending. Meanwhile, Unilever PLC's Mentadent has shot from nowhere to a 12 percent share in three years. Crest and Mentadent scored against Crest with products containing baking soda and peroxide.

Despite all the new attention from toothpaste makers, gingivitis is a tricky marketing hook, especially when targeting youth-conscious baby boomers. The handful of existing gum products — including Mentadent Gum Care and SmithKline Beecham's Aquafresh Gum Care — aren't breaking sales records.

Worm

> Continued from Page 29

The ball's extraneous nature has overrun city homes and farms.

"Many of the current pig laws follow regarding high-density livestock and poultry production were written nearly a generation ago, when we never envisioned tens of millions of birds confined to a small area and generating waste," Mr. Nash said.

Mr. Nash said his group is working with legislators to introduce a bill next year that would give the E.P.A. the authority to conduct environmental background checks of companies opening poultry or livestock "mega-farms."

The E.P.A. has no authority under Ohio law to conduct such checks, but would consider supporting a bill that would allow it to do so, agency spokesman Jim Leach said.

"We'd want to take a look at it, of course. Generally speaking, if it's something we feel will help us do a better job serving all the citizens of Ohio, we certainly would welcome that," Mr. Leach said.

In April, the company was cited for bringing eggs into the LaRue farm for washing and in June, the E.P.A. sent AgriGeneral a notice to bring dead birds out of two buildings daily until they can move them off-site. No fines were levied, but AgriGeneral has challenged the E.P.A.'s June citation. Mr. Leach said.

AgriGeneral co-owner Anton Pohlmann was found guilty by a German court last month of violating German drug laws and failing to help a former worker who was injured when he used an illegal nicotine-based spray to treat chickens for mites.

Mr. Pohlmann was fined $2 million and sentenced to two years probation.

AgriGeneral spokeswoman Amy Bast said Mr. Pohlmann was not immediately available to comment.

---

As a blade supplier, we hope that you are satisfied with our service. We will need to inspect your shop.

From time to time, damages may occur when glass sheet is handled. If this happens, we may sell you a replacement for a cheaper rate.
From Satellites to Earthworms!

Both earthworms and satellites can help farmers improve farming practices and increase crop yields. Find out how by attending this program on Tuesday, August 27. It will be held at the Bowling Green Future Farmers of America test plots (Fairfield Ave.).

Speakers will cover a range of agricultural topics from the benefits of no-till farming to using satellite technology to improve crop yields.

A meal from Harland's BBQ will be served, free of charge, to the first 125 persons attending. Binders that are packed full of information from the presentations will be available to the first 125 attendees. The first 50 attendees will receive an added bonus: The Farmer's Earthworm Handbook.

The program begins at 4:30 p.m. and ends around 8:30 p.m. You do not have to register or pay to attend this program. If you do have questions, contact either Jenny Carter (TMACOG) at 419-241-9155, ext. 125 or Cherie Blevins (Ohio EPA) at 419-352-8461, ext. 3010. This program is funded by a grant through the Lake Erie Protection Fund.

TMACOG's Maumee RAP Implementation Committee action group on agricultural runoff has coordinated this program with: Wood County Con-Till Club, Wood Soil and Water Conservation District, Bowling Green Future Farmers of America, CIBA Crop Protection, LG Seeds, Luckey Farmers, MidWood Inc., Natural Resources Conservation Service, OSU Extension, Ohio Department of Natural Resources, and Ohio Environmental Protection Agency.

The Maumee RAP Implementation Committee works with federal, state, and local governments as well as area citizens to restore the health and beauty of the Maumee River ecosystem.

New Name

A contest to rename the building we're in has been wrapped up. It's official ... our building name is Central Union Plaza.

Our street address will change from 415 Emerald Avenue to 300 Central Union Plaza. Please, though, use our post office box to mail anything to us XV.

Thanks for Your Time!

"Thank you" to everyone who filled out and returned the COGnates newsletter survey. We had a lot of good comments on what to keep and what to change.

A New Look for COGnates?

Not yet. Because of Windows, we're now converting layouts to a program similar to what we used in DOS. As always, conversions aren't perfect so we're forced to substitute some fonts. Look for major changes later this year.
Calendar

August

Air Quality Task Force
Wednesday, August 21, 1996; TMACOG board room, Central Union Plaza, 3rd floor, Toledo; 8:00 a.m.

Expressway Needs Committee
Wednesday, August 21, 1996; TMACOG board room, Central Union Plaza, 3rd floor, Toledo; 1:30 p.m.

Board of Trustees
Wednesday, August 21, 1996; Port Clinton Council Chambers, 1868 E. Perry St., Port Clinton; 3:30 p.m.

MRIC Dumps and Landfills Action Group
Thursday, August 22, 1996; Cousins Waste Control Corp. 1701 Matzinger Rd., Toledo; 3:30 p.m.

MRIC Open Space and Wetlands Action Group
Thursday, August 22, 1996; Lucas Soil and Water Conservation District, 130-A W. Dudley St., Maumee; 4:30 p.m.

PR/Marketing Committee
Friday, August 23, 1996; TMACOG board room, Central Union Plaza, 3rd floor, Toledo; 7:30 a.m.

"From Satellites to Earthworms: Improving Farm Management"
Tuesday, August 17, 1996, FAA test plots (behind Bowling Green High School), Fairfield Ave., Bowling Green. It begins at 4:30 p.m.

MRIC Ottawa River Action Group
Thursday, August 29, 1996; Conference Room, Toledo Division of Environmental Services, 26 Main St., Toledo; 1:30 p.m.

September

Joint Transportation Committees
Wednesday, September 4, 1996; TARTA, 1127 W. Central Ave., Toledo; 1:30 p.m.

Maumee River Crossing Task Force
Thursday, September 5, 1996; TMACOG board room, Central Union Plaza, 3rd floor, Toledo; 7:30 a.m.

"The Forum" for Northwest Ohio
Thursday, August 1, 1996; Toledo Area Chamber of Commerce board room, 300 Madison Ave., Toledo; 1:30 p.m.