



Helping People Help the Land

# Conservation Notes

USDA - Natural Resources Conservation Service - Michigan

September/October 2018

## He's Leaving the Soil Better than he Found It

Conservation-minded farmers often talk about leaving the land in better condition than they inherited it, Eaton County farmer Paul Upright really is. He is the fifth generation of his family to farm the 260 acres of land between Charlotte and Potterville, and he'll be the last.

After 30 years of practicing no-till, along with other conservation practices like single species cover crop, Upright had no doubt when asked if the soil is in better condition than when he took over the farm. "Absolutely!"

NRCS District Conservationist, Tim Redder pulled up a spade full of soil from a field planted with cover crops to demonstrate how Upright has been building healthy soil. The soil had a uniform, dark color and texture for a foot below the surface and could be easily crumbled, both signs of good soil structure, Redder said. Soil tests show the soil on Upright's farm has over 4 percent organic matter content, about double the amount typically found in conventionally tilled soils in Eaton County according to Redder. Organic matter is valuable as it stores nutrients for crops and holds water, making it more available to crops throughout the growing season.

Going to a no-till system and a rotation of soybeans and wheat, has made farming simpler for Upright who also worked for General Motors before retiring. He jokes that he converted to no-till 30 years ago "just because I'm lazy and cheap." Indeed, cutting down on tillage has saved him in fuel costs and time on a tractor but Upright is also quick to point out

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*Eaton County farmer Paul Upright holds a radish he planted as part of a cover crop mixture on his farm following wheat harvest.*



United States Department of Agriculture

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## State Conservationist's Message

By this time, the cut-off date for the first selection of applications for fiscal year 2019 Environmental Quality Incentives Program funding will have arrived. This first selection was limited to funding targeted to high priority conservation areas, such as the Western Lake Erie Basin, and for national initiatives including organic production and on-farm-energy conservation. The announcement for the general EQIP cut-off date will come before the end of the calendar year.

With the additional funding Michigan has received to address water quality in the Great Lakes, the timing is good for producers interested in trying out new conservation practices to enroll in EQIP. Even if a producer isn't located in a targeted high-priority area, funding available through the Regional Conservation Partnership Program and the Great Lakes Restoration Initiative, for example; has freed up general EQIP funds for other parts of the state.

A producer who has been hesitating to implement practices like conservation tillage or cover crops can make the transition easier by receiving EQIP assistance. EQIP also allows producers to implement a practice on only a portion of their land. This provides an opportunity to evaluate practices before implementing them operation-wide.

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NRCS is asking producers to skip doing fall tillage as part of our [No-Till November](#) campaign. Reducing tillage is a key component to improving soil health and water quality. Disturbing the soil with tillage harms soil structure, making it more

prone to erosion and over time it will inhibit water infiltration and rob the soil of organic matter.

No-till is not a panacea for all resource concerns related to field crops. Research has shown that conservation practices like no-till are most effective when incorporated with other practices like cover crops, nutrient management, and a conservation crop rotation. Every operation is unique which is why producers should work with NRCS to

create their own individualized conservation plan.

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With the Web Soil Survey, NRCS has long been a resource for anyone needing soils information. In early October the USDA announced a re-designed [Soil Tools web page](#). The web page is intended to provide an easy entry point for accessing

the vast amount of soils information and tools available from NRCS.

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On the subject of soils, beginning with this issue of Conservation Notes, is a series of features highlighting the work of the Major Land Resource Area office in Grand Rapids. The MLRA office works under the national Soil Science Division and reports to its area administrative office in Amherst, Mass. As you will learn, that does not prevent the office from working on projects focused on Michigan or from assisting NRCS-Michigan in our conservation mission.



*State Conservationist  
Garry Lee*





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## Leaving the Soil Better than he Found It

the benefits to his soil by reducing the amount of tillage. He remembers seeing yellow clay when he first began tilling his fields, you'd have to dig deep to find any clay now, said Upright.

In addition to no-till, Upright utilized a rye cover crop to control erosion and improve soil quality. Several years ago, he enrolled in the USDA's Conservation Stewardship Program which provides annual payments for existing conservation practices and incentives to make additional conservation enhancements. One of the enhancements Upright implemented was implementing more diverse mixtures of cover crops. After this year's wheat harvest he planted a mixture of cover crops that included radishes, clover, oats, millet, and most noticeably sunflowers.

"Paul is a good example of what the CSP program was created for," said Redder. He was already controlling soil erosion through no-till and cover crops and the program provided the incentive to do even more by planting a multispecies mixture of cover crops. A cover crop mixture includes species that fix nitrogen, scavenge nutrients and increase biodiversity in the soil as well as above ground. Redder observed many honey bees collecting pollen on the sunflowers and other blooming plants in Upright's field, which just happens to be across the street from an orchard.

"Paul is our example in the county," said Redder. Redder uses him as an example of how no-till and cover crops can be incorporated successfully to build healthy soils. Upright was also one of the first farms in the county to become environmentally certified through the Michigan Agriculture Environmental Assurance Program. He is now also certified in three MAEAP systems, cropping, farmstead and forest, wetland & wildlife habitat.

Although it's "time to smell the roses" for Upright, stewardship of the land that has been in his family for over 100 years is still important to him. He made sure to rent his land to a farmer who will continue using no-till and cover crop practices to conserve and improve the soil.



*A 19th century barn still stands on the property (top right). Paul Upright had his farm environmentally verified in three systems through the MAEAP program. The land has been farmed by his family for over 100 years (above left). District Conservationist Tim Redder displays soil from Upright's field (above right).*

## MSU Researches Cost Effective Ways to Reduce P Runoff

Nutrients like phosphorus and nitrogen will always find their way into the Great Lakes. The most cost-effective method to reduce the amount coming from agricultural land is one of the questions Michigan State University Assistant Professor Ehsan Ghane is trying to answer with his research project in Lenawee County.

Beginning on Oct. 1, Ghane's research team has been collecting daily water samples from field tiles at three locations in Lenawee County. His sampling will compare runoff water from fields with conventional tile drainage; fields utilizing a water control structure to manage the release of drainage water; and a field utilizing a saturated buffer, where drainage water saturates a buffer strip between the field and the drain through perforated tile within the buffer. All of the testing sites are draining fields that utilize the same agronomic practices, so the only variable will be the drainage practices, said Ghane.

Ghane started the project in 2017 with funding provided by the Michigan Department of Agriculture and Rural Development and the Michigan Department of Environmental Quality. The funding specified that testing was to take place in the Western Lake Erie Basin. The WLEB is a priority area for water quality due to algae blooms in Lake Erie linked to agricultural runoff. The first step for Ghane was finding farmers willing to have testing conducted on their land.

"We have great collaborators, they're conservation-minded. They want to keep the water clean while making a living," said Ghane.

All of the cooperating producers utilize no-till which pleases Ghane. He believes that no-till will become the norm in field crop production. No-till is not a panacea for water quality however. Recent



*Dr. Ehsan Ghane of Michigan State University (front) is conducting research on phosphorus runoff through field drainage tiles in Lenawee County. Ghane presented his project to USDA leadership at one of his testing locations on the Isley farm.*

research indicates that phosphorus loss through tile drainage is higher in no-till cropped fields than in fields with more tillage. No-till soil has better structure with macropores that allow water and phosphorus to travel through the soil faster.

What Ghane hopes the project will ultimately determine is what practice most cost-effectively reduces the amount of phosphorus runoff. Conservation has to make sense

economically, he said. The research in Lenawee County will determine how much it costs to remove phosphorus from drainage water for each conservation practice. (Both practices, drainage water management and saturated buffers, are eligible for USDA conservation financial assistance through the Environmental Quality Incentives Program.)

Ghane's project will collect data for 5 years, comparing the amount of phosphorus leaving the test fields through drainage tile. The test equipment will collect composite samples for each day of testing. All of the research Ghane knows of utilized weekly testing. Phosphorus levels if drainage water are much more variable than nitrogen levels, Ghane said. He hopes his testing can more precisely compare changes in phosphorus levels to the timing of agronomic practices, like fertilizer applications, and weather events.

Ghane and his research team plan to hold field days throughout the project to share the data they have collected.



## NRCS Participates in Archeology Day in Lansing

Members of the Michigan NRCS cultural resources staff took part in Michigan Archeology Day at the Michigan History Center in Lansing on Oct. 13.

The family-oriented event is held each year but NRCS participated for the first time. State Archeologist Duane Quates and Cultural Resources Coordinator Melissa Gutierrez hosted an exhibit where attendees could learn about the conservation mission of the agency and how it protects cultural resources while providing conservation assistance on working lands.

Quates took his turn appraising artifacts at the event's Archeology Road Show. The activity was similar to the Public Television program where people brought in their objects for appraisal by experts. The day's events also included hands-on activities and a scavenger hunt.

Archeology Day is sponsored by the Michigan History Center and the State Historic Preservation Office.



*State Archeologist Duane Quates talks with a visitor at the NRCS exhibit during Archeology Day at the Michigan History Center.*

## Earth Team Volunteers Assist with Archeology Survey of PMC

A group of volunteers from Michigan State University assisted with the ongoing archeological survey of the Rose Lake Plant Materials Center.

A group of seven MSU campus archeology program fellows, including six students and an instructor, spent an October morning conducting a pedestrian survey followed by a shovel test probe in the afternoon. Artifacts found that day, and in previous work, date to between 1,100 and 3,300 years-a-go, said NRCS State Archeologist Duane Quates.

Evidence indicates the area was intensely used to access wetland resources, Quates said. Finding more intact artifacts would assist in narrowing down when the area was visited. Under an agreement with the Michigan State Historic Preservation Office, NRCS will complete the archeological survey of the PMC by 2028.

Utilizing groups of Earth Team volunteers is an effective way to staff events or take on conservation activities that require many hands. Earth Team volunteers are covered under Workers Compensation in the event of an accident while they are participating in an authorized work assignment.



*Earth Team volunteers consisting of MSU archeology students conduct a pedestrian survey at the Rose Lake Plant Materials Center near East Lansing.*

Members of a volunteer group who are at least 18 years of age are not required to complete an Earth Team Volunteer Service Agreement.



# MLRA Staff Assist with Wetland Determinations

- Grand Rapids MLRA Staff

Michigan NRCS receives hundreds of wetland reconsideration requests annually. This workload is too high for current staff to keep up so the assistance of the MLRA Soil Survey Offices in Grand Rapids and Flint has been requested for the past 6 years. In 2013, all Soil Scientists at these offices attended Regulatory IV Wetland Identification and Delineation training. This training covered the three criteria for wetland determination: hydrology, hydrophytic vegetation, and hydric soil.

Every year since, staff members have devoted 15% of their time (about 300 hours) each to the completion of wetland reconsiderations. These reconsiderations are submitted by landowners and/or operators who disagree with a preliminary off-site determination. The tracts of land that MLRA staff have worked on contain anywhere from 1 to over 300 acres of wetland delineations and can take anywhere from a couple of hours to several days. In 2018, the Grand Rapids staff completed a total of 61 tracts. Soil scientists working in the office this year included Jon Quisler, Jonathan Diaz Cruz, and Matt Bromley. Greg Schmidt, Eco Site Specialist, also provided many hours of support with identifying plant species both in the field and office. A wide variety of wetland types were seen this year including wet meadows, vernal pools, forested swamps, and shrub swamps.

Wetlands provide a variety of important functions including flood protection, ground water recharge, nutrient and pollutant removal, and wildlife habitat for unique plant and animal communities. Approximately half of Michigan's natural wetlands have been lost since presettlement days. Protection of the remaining wetlands is an ongoing effort and accurate identification and delineation of these areas is a critical step in that process. For the foreseeable future, MLRA staff will continue to provide this Technical Soil Service to the state.

*MLRA Soil Scientist Jonathan Diaz Cruz documenting the soil while performing a wetland determination. (above right) Aquatic fauna (fingernail clams) being documented as a primary indicator of wetland hydrology. These tiny mollusks can often be found living in vernal pools and are an important indicator during the driest part of the year when other indicators may not be present. (right)*

## Grand Rapids MLRA Office

Major Land Resource Area Soil Survey Offices are part of the NRCS Soil Science Division. The one MLRA office in Michigan is located in Grand Rapids. The Grand Rapids office is assigned to Soil Survey Region 12, which has its administrative office in Amherst, Mass.

MLRA staff primarily work on national projects such as the National Cooperative Soil Survey. This work includes updating and improving the information available on the Web Soil Survey. They also assist states with their technical soil service workload in coordination with the state soil scientist and area resource soil scientists.





# Oak Wilt Treatment Success

by Bill Cook, MSU Extension Forester/Biologist

Oak wilt is a pernicious exotic disease that has expanded across much of Michigan and Wisconsin. It's been around for decades, however. Its presence has captured the attention of many conservation groups and has led to seasonal timber harvest restrictions. It's a tough disease to control and typically involves significant changes in the visual quality of a forest stand.

Oak wilt spreads throughout an oak stand via underground root grafts. It's this research-based distance of underground spread that determines the "footprint" of an infected area (aka epicenter). Containing the underground spread and removing the oaks within the perimeter of this footprint is the treatment goal.

The trees that present a threat of overland transmission, via sap-feeding insects, are those oaks that died the previous growing season. The pathogen kills the tree in one year, then produces fruiting bodies on the dead oaks the next year. This is why recently-killed trees require quarantine or prompt destruction.

From 2004 through 2013, over 200,000 feet of trenching was done, on both public and private forestland in Menominee and Dickinson Counties, with some epicenter complexes well over 40 acres. Over this decade, many of the largest oak wilt areas were treated, which reduced the potential for overland spread.

Untreated areas produce new spore-producing trees each year. The presence of this "inoculum" results in new epicenters in previously healthy oak stands. As fewer acres of oak wilt exist in the landscape, the level of inoculum goes down, reducing the risk of new infections.

For three years, from 2014 through 2016, about 116 sites were treated on state land in Menominee County. These were all small epicenters, the aftermath of the previous decade of aggressive treatments in the region. The average size was about 1.5 acres, employing 2339 feet of root-severing trenching. Each of these sites are to be monitored for at least three years.

After two to four years of monitoring, with one more year to go (2019), there are four sites where



Post-treatment boundary in a stand of almost exclusively oaks. (above) Vibratory blade cutting five feet into the ground. (below)

- photos provided by MSU Extension



the treatment may have failed. That's a success rate of almost 97 percent. There is some uncertainty about whether the four failures are actually failures. Oak wilt can spread overland, beyond the footprint perimeter, to an outlier tree that shows no symptoms during the set-up period, which is best done in late August. It's also possible the technician missed an outlier tree during the reconnaissance.

During the monitoring period since 2016, another 28 new sites with dead or dying oaks were observed while visiting treatment sites, although

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## NRCS Employees Get a Taste of Diversity

Employees got a “Taste of Diversity” during a program sponsored by the NRCS Michigan Civil Rights Advisory Committee on Sept. 6, in East Lansing.

Presentations included a mental wellness exercise by MSU Extension Instructor Hanna Hotchkiss; an informational program on breastfeeding by Tammy Ashley, a lactation consultant with Sparrow Hospital in Lansing; and a presentation on recovery efforts in Puerto Rico by Edwin Martinez with a call-in from NRCS Puerto Rico Director Edwin Almodovar.

Diversity programs provide an opportunity for employees to learn about issues affecting their co-workers and customers. The CRAC holds events throughout the year on a variety of topics.



*Lactation Consultant Tammy Ashley distributes materials during her presentation at the NRCS Diversity Day. (above)*

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## Oak Wilt Treatment Success

reconnaissance was not part of the monitoring goals. The 17 sites from 2017 displayed diagnostic spore mats and pressure pads in 2018. The 11 sites in 2018 were assumed to be infected with oak wilt. Almost all of these new sites were the result of wind damage, such as broken limbs, windthrow, and wounds from nearby falling trees.

While forest management recommendations continue to evolve, there are possible conclusions and suggestions as a result of the monitoring of the 2014-2016 sites and other experience:

- Treat oak wilt epicenters as soon as possible.
- Commercial harvest of small areas is difficult for a private forestowner.
- Avoid wounding oaks from mid-April through mid-July.
- New epicenters are often the result of wind damage. Inspect your woodland after significant wind events. Remove damaged oaks as soon as possible. Do not wound standing oaks in the process.
- Consider the risk of leaving a stand of residual large oaks in areas with oak wilt in the landscape. They're more susceptible to wind damage.
- Single-tree infections, caught soon enough, can

be effectively treated by stump-pulling.

- For more advanced epicenters, but still small, a double-girdling / herbicide technique has shown some success.
- Injections by certified applicators can protect healthy oaks, but cannot save infected oaks.
- Rapid leaf browning and total mortality (within a month or so) suggests oak wilt. Wilting leaves often have a distinct border between the green and the brown. However, only a lab tissue culture or the presence of fruiting bodies (from dead oaks the year before) are diagnostic for oak wilt. There are damaging agents that resemble oak wilt symptoms.

If you suspect oak wilt on your woodland property, contact a forester (or several). Many County Conservation Districts house a service forester. All areas of Michigan and Wisconsin have nearby consulting foresters. University Extension and state natural resource agency websites and other Internet sources contain relevant information. However, keep in mind that not all foresters are familiar with oak wilt and not all “experts” are experts.

*This article was published by Michigan State University Extension. For more information, visit <http://www.msue.msu.edu>.*



## Upcoming Events - Upcoming Events

### November

- 3 Basic Woodland Management, 9 a.m. to noon, Heikema Farm - Jones, for more information and to RSVP contact the Cass Conservation District at 269/445-8641 ext. 5
- 3 Biochar Workshop, 10 a.m. to noon, Grow Benzie Event Center - Benzonia, for more information and to register, contact the Benzie Conservation District at 231/882-4391
- 7 Timber & Taxes Workshop, 6:30 - 9 p.m., Boardman River Nature Center - Traverse City, For more information or to register, contact District Forester Kama Ross at 231/256-9783 or kama.ross@macd.org

### December

- 4-6 Great Lakes Fruit, Vegetable and Farm Market Expo, Devos Place Conference Center - Grand Rapids, for more information go to [glexpo.com](http://glexpo.com)
- 5 Saginaw Bay Lunch & Learn, 11 a.m. to 1:30 p.m., Saginaw Valley Research & Extension Center - Frankenmuth, advance registration required, go to [www.nature.org](http://www.nature.org) for more information
- 8 Fish Like a Girl Workshop, 9 a.m. to 3:30 p.m., Ralya Elementary School - Haslett, workshop fee is \$40, for more information go to [www.projectfish.org](http://www.projectfish.org)



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### Save the Date:

Center for Excellence Crop Day - Jan. 11

Northern Michigan Small Farm Conference - Jan. 25 & 26

Michigan Family Farm Conference - Feb. 9

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