Ohio's Professional Soil Scientists

2019 SUMMER NEWSLETTER
VOLUME 46, ISSUE 2

On the Cover

Two soils with contrasting drainage: L - a well drained Miamian (fine, mixed, active, mesic Oxyaquic Hapludalfs) profile from Franklin Co., OH; R – a poorly drained Ragsdale (fine-silty, mixed, superactive, Typic Argiaquolls) profile from Clinton Co., OH. Photo credits J. Bigham

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Calendar of Events

- Soil Health Institute, 4th Annual Meeting – Jul. 16 – 18, Sacramento, CA
- SWCS Annual Conference – Jul. 28 - 31, Pittsburgh, PA
- Certified Crop Adviser (CCA) Exams - Aug. 2 - various locations
- 2019 Ohio SCS/NRCS Retirees Luncheon - Aug 14 - MCL Cafeteria at 5240 East Main Street, in Whitehall, OH
- Earth Science Week "Geoscience Is for Everyone" - Oct. 13-19
- Onsite Wastewater Mega Conference - Oct. 14-16, Loveland, CO
- ASA, CSSA, SSSA Annual Meeting - Nov. 10-13, San Antonio, TX
- SSSA Fall Certification Exam - Nov. 15 - various locations

If you know of an upcoming local, regional, national or international event that might be of interest to our members, please submit the name, date, location, and any available link to our Editor.

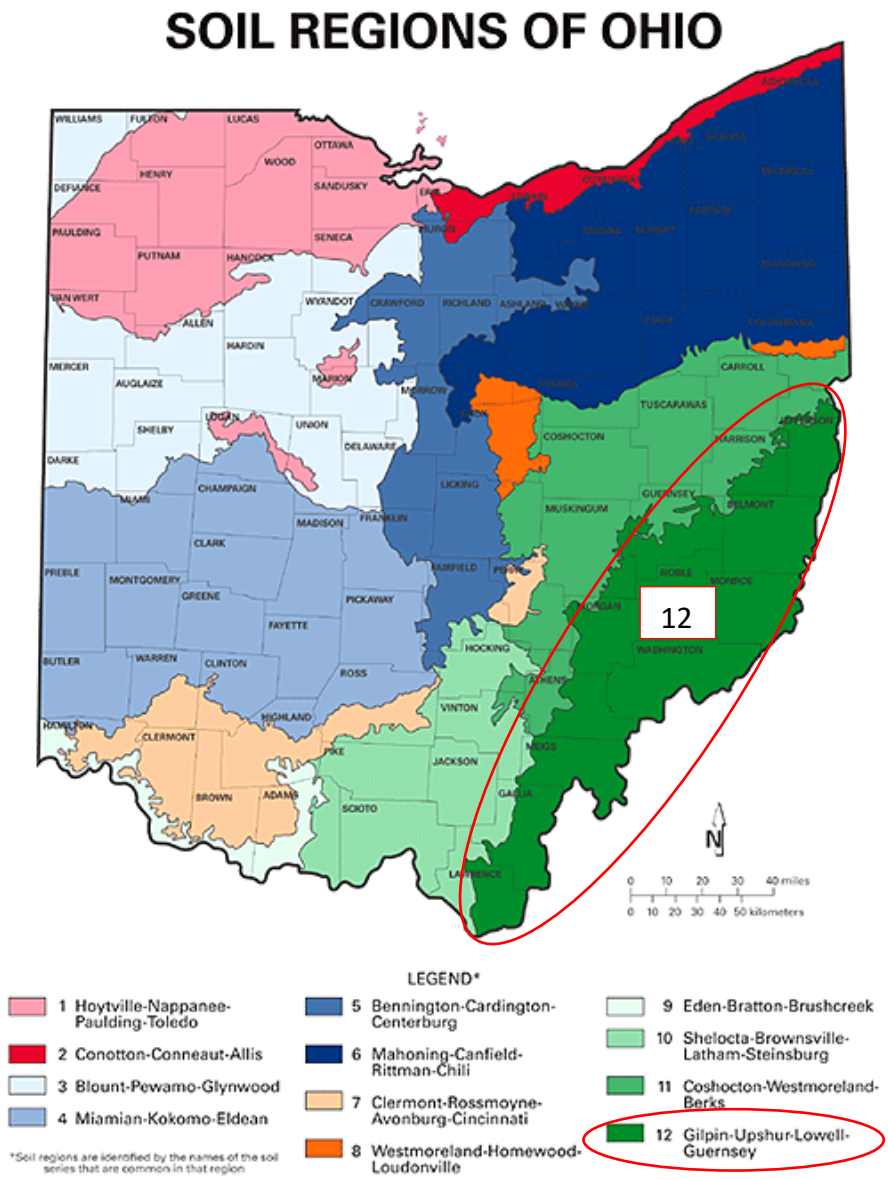
President's Message

You may have noticed that water (Charles Mill Lake) is the background of my profile picture. That water has also been the background image for this spring as farmers have tried to plant or make hay or as those of us in the soils world have tried to do field work. My Mom and Dad are fortunate to have a cottage, pontoon boat, and dock on Charles Mill Lake, which is a Muskingum Watershed Conservancy District flood control lake. Recently, the lake reached about 10 to 11 feet above the summer pool (the dock support pipes end at about 8 feet), and we had to perform a kayak-based boat and dock rescue as well as tie some absent neighbor's boats to trees while there. To avoid many repeat trips to retie the boat as water levels change we decided to take the boat out by trailer. We had to adapt and overcome by avoiding floating logs and loading a pontoon boat onto a trailer from a flooded gravel drive. With the excess water this spring, a lot of us have had to find ways to adapt and overcome. Now that summer has arrived hopefully we can have some much needed sunshine and drying weather (but of course not too much!).

Jeff Glanville has been hard at work putting together the AOP Workshop stressing a back to our pedologic roots focus on soils of southeastern Ohio. This two-day workshop has a very interesting agenda that will focus on pedology/geomorphology, with a number of soil pits to examine. Take a look at the tentative agenda and be sure to mark your calendar for September 11-12. Registration information will be sent out in a separate email.

In the spring newsletter, I mentioned that I volunteer to help with our local land judging contest and have helped Steve Prebonick with the area contest. Recently, I was contacted to help again in September by the Wayne SWCD and the Vo-Ag instructor that is responsible for the local contest. I encourage you to assist with local contests when possible. These contests expose students to the importance of soil and how it impacts management decisions both rural and urban. The contests are also a great opportunity for potential recruitment of future soil scientists! Students get to see real live soil scientists in action, ask questions about potential jobs, or where they might attend college. Yes, it does take time away from other things, in my situation consulting, but to me it's worth it. It's a way to give back and to help promote an interest in the importance of soil.

Hold the Date – AOP Autumn Workshop
September 11-12
Cambridge, Ohio
Major Soils of Region 12



The proposal brought forward during the winter meeting was that we hold future workshops in a somewhat standard format. The intent is to introduce members to soils in each of the 12 Ohio Soil Regions. Also, in response to requests from membership, training will be the focus of these workshops. This training will be two-fold:

pedology/geomorphology, to include exercises in describing soils and landscapes; and applied, to include exercises in sewage treatment evaluations and other uses.

The initial workshop this year will be centered around the Cambridge area, focusing on Soil Region 12. Major soils are Gilpin-Upshur-Lowell-Guernsey, with inclusions of mine soils and old alluvial soils.

Dates are September 11 and 12. Due to the amount of material to be covered and the nature of how soil descriptions are done, both days will be very busy and will end late afternoon.

Tentative Agenda

Day one A.M.:

- overview of geology, soils, and the 12 soil regions
- history of soil survey activities in the area
- soil genesis, morphology, and classification
- classification and correlation issues and problems
- university research
- overview of land use/resource concerns – agriculture, mining, etc.

Day one P.M.:

- Pedon descriptions in the field. Goal would be to have 3 or 4 pits, in 1 or 2 locations, that would allow participants to separate into groups, with each group working together to describe 1 landscape/pedon. Groups would then rotate to other pits to review descriptions already recorded by other groups.
- Discussion on mapping concepts, soil-landscape relationships, and the correlation process.
- Texturing contest!

Day two A.M.:

- review of day one
- land use history, farming practices, resource concerns, etc.
- erosion, land modification, mining, urbanization, etc.
- research related to use and management
- overview of septic evaluations

Day two late A.M. and P.M.:

- soil descriptions for septic evaluation, in the field
- soil descriptions on reclaimed mine soils, in the field

Exposure of Sedimentary Rocks in Region 12.

Combining Pleasure and Professional Development

This year, there are some excellent opportunities for combining work and play by participating in national meetings. If you prefer to stay close to home, the 74th International Soil and Water Conservation Society Conference is being held July 28-31 in Pittsburgh, PA.

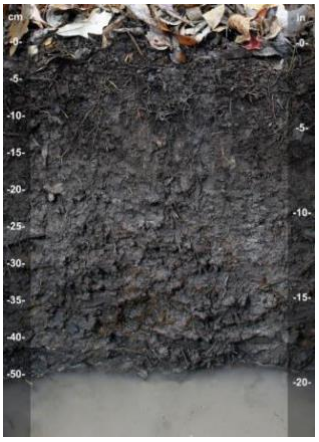
74th SWCS International Annual Conference
Wyndham Grand Pittsburgh Downtown
July 28 - 31, 2019
Pittsburgh, Pennsylvania

Register by Mail

Register Online

If you prefer nature and the majesty of the Rocky Mountains, you might consider attending the Onsite Wastewater Mega-Conference being held Oct. 13 – 16 in Loveland (Denver), Colorado. The Mega-Conference is a combined effort between the National Onsite Wastewater Recycling Association (NOWRA), the National Association of Wastewater Technicians (NAWT), the State Onsite Regulators Alliance (SORA), and the Colorado Professionals in Onsite Wastewater (CPOW). The program will include papers on the policies, technology, installation, and maintenance of onsite wastewater systems.

Finally, the Soil Science Society of America Annual Meeting will be held Nov. 10 - 13 in historic and beautiful San Antonio, TX. Of special interest is a symposium to be hosted by the SSSA Wetlands Division on Soil Chemistry and Hydric Soil Indicators. For questions, contact: Chelsea Duball (cduball@uwyo.edu) or Karen Vaughan (karen.Vaughan)



EMBRACING THE DIGITAL ENVIRONMENT

2019 ASA-CSSA-SSSA International Annual Meeting | Nov. 10-13 | San Antonio, Texas

SSSA Wetlands Division – Symposium and Oral session (includes student competition)

"Across the Ladder": Recent Advancements in Assessment of Reducing Soil Conditions and Hydric Soils Identification

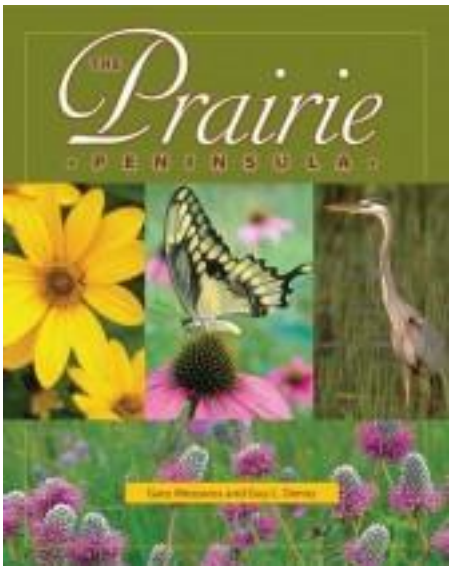
Alternating oxidizing and reducing conditions in soils influence numerous critical chemical reactions, potential for plant growth, soil organic matter dynamics, and the survival of organisms among others. The quantification of reducing soil conditions is driven by saturated soil conditions and is particularly important in the assessment of wetland function and identification of hydric soils. The redox ladder serves as a useful guide indicating the hierarchy of chemical compounds used as terminal electron acceptors during microbially mediated reduction reactions: $O_2 \rightarrow H_2O$; $NO_3^- \rightarrow N_2$ - NH_4^+; $Mn^{4+} \rightarrow Mn^{2+}$; $Fe^{3+} \rightarrow Fe^{2+}$; $SO_4^{2-} \rightarrow S^{1-}$ - S^{2-} ; TOC, $CO_2 \rightarrow CH_4$. These dynamic reactions proceed as a function of the seasonality of saturated soil conditions. Advancements in methodologies and research over the past decades have improved our capacity to quantify and assess reducing soil conditions while simultaneously improving proper wetland delineation, functional assessments of wetlands, and wetland biogeochemical studies at large. This session aims to highlight advancements and ongoing research focused on the assessment of reducing soil conditions in order to improve hydric soils identification, our collective understanding of wetland biogeochemistry, and to further inform wetland management and conservation efforts.

Projects and papers focused on:

- Use and advancement of wetland identification tools (i.e. IRIS, MnIRIS, aa strips, etc.)
- Hydric and hydromorphic soil identification and problematic soils
- Oxidation-reduction potential research
- New methods or findings in the realm of reducing soil conditions

From the Library

The Prairie Peninsula
The story of a once vast North American ecosystem



The prairie grassland biome covers the heartland of North America with an eastward extension called the Prairie Peninsula. Primarily composed of tallgrass prairie, this biome lies between the shortgrass prairies of the west and the eastern deciduous forest region and includes the states of Illinois, Indiana, southeastern Wisconsin, and Ohio.

With text by coauthors Gary Meszaros and Guy L. Denny and striking photographs by Meszaros, *The Prairie Peninsula* examines the many prairie types, floristic composition, and animals that are part of this ecosystem. It took only 50 years for 150 million acres of tallgrass prairie to disappear under the steel plow, transforming the Prairie Peninsula into fields of corn and wheat. Today, only a few thousand acres of this endangered ecosystem remain in small parcels, some just a few acres each. The second half of the 19th century brought the mass slaughter of prairie wildlife. By 1900, like the prairie they roamed, the plains bison, gray wolf, and eastern elk became extirpated east of the Mississippi River.

The Prairie Peninsula also tells the story of the early settlers and the hardships they endured. Thousands died of milk sickness and malaria, with prairie fires sending flames 30 feet into the air and stretched across the horizon, destroying everything in their path. Today, many of these pioneers lie buried in cemeteries comprising prairie remnants, fragments of the primeval land they tried to tame. The authors investigate these and other surviving prairie remnants and current efforts to save these traces of original North American grassland.

Both Gary Meszaros and Guy L. Denny have traveled extensively throughout the Midwest, studying the animal and floristic composition of original prairie remnants. A photographer for more than 40 years, **Gary Meszaros's** images have appeared in numerous nature magazines and textbooks. He is the coauthor of and has contributed photographs to five books published by The Kent State University Press, including *Native*

Fishes of Ohio (2014) and *Wild Ohio* (2008). **Guy L. Denny** is a retired chief of the ODNR Division of Natural Areas and Preserves. A former director of the Ohio Biological survey, he is the current president of the Ohio Natural Areas and Preserves Association.

Available from The Kent State University Press

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Kent, OH 44242-0001
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SOIL JUDGING – FLASHBACK AND MORE!

The 1984 National Soils Contest was hosted by Cal. Poly. State University in San Luis Obispo, CA on April 9-13. The Ohio State team flew in (April 8) and out (April 15) of San Francisco and proceeded to the contest with a rental car. Lodging was provided at the Rancho El Chorro Environmental Center located midway between San Luis Obispo and Morro Bay on Hwy 1 across from Cuesta College. The very challenging contest was won by the University of Maryland, and the Ohio State team placed a solid 4th. A highlight of the program was a lecture by the late Dr. Hans Jenny on Wednesday, April 11. The OSU team also visited the Hearst Castle and traveled through the Sequoia National Park following the contest.

L – R: Andy Bayham, Beth Guertal, Rick Leopold, James Peart, and Steve Weihl; Beth currently serves as President of the Crop Science Society of America.

Thirty-five years later (April 14 - 19, 2019), the national contest was again hosted by Cal. Poly. State University and was again won by the University of Maryland (https://www.agronomy.org/files/students/contests/ncsc-2019-results.pdf).

The National Collegiate Soils Contest has been held every year since 1961 and has gained visibility outside the discipline of Soil Science. The following article about this year's contest appeared in *EOS* – a weekly Earth and space science news magazine published by the American Geophysical Union:

EOS *Earth & Space Science News*

Making the Grade: A Week at the National Soil Judging Contest

Students from around the country recently convened for the National Collegiate Soils Contest and promptly crawled into backhoe-scraped pits to dig into soil science.

At the National Collegiate Soils Contest, students gain experience describing soil properties like horizons, texture, color, and structure. Credit: Nico Navarro

By Aaron Sidder 30 April 2019

On a mild February day in Loveland, Colo., a group of students from Colorado State University (CSU) squatted around a shallow hole dug into the floodplain of the Big Thompson River. Their attention shifted, back and forth, from the moist balls of soil in their hands to the patterned soil texture triangles on the clipboards beside them.

Two months out and the team was focused on the upcoming national soil judging contest.

"The contest allows the students to investigate soil types that they would otherwise not be able to see. "Formally known as the National Collegiate Soils Contest, this year's competition ran 14–19 April in San Luis Obispo, Calif., home of California Polytechnic State University (Cal Poly). Sponsored by the American Society of Agronomy, the Soil Science Society of America, and the Natural Resources Conservation Service (NRCS), the National Collegiate Soils Contest has been held every year since 1961.

A record 26 teams from around the country competed this year, including from both CSU and Cal Poly. Although the event is competitive, it is mainly an opportunity for students to broaden their (soil) horizons.

"In the pedology course that I teach, we don't have the chance to go more than an hour's drive from campus," explains Suellen Melzer, an assistant professor of soil and crop science at CSU and one of the team's co-coaches. "The contest allows the students to investigate soil types that they would otherwise not be able to see."

The Competition

The national contest is spread across 6 days, with the first 4 allocated for practice and the final 2 for competition. At a minimum, each student probes nearly 20 different soil pits—carved by a backhoe—and gains experience describing soil properties like horizons, texture, color, and structure.

Although each team gets access to the same practice pits, the site of the contest pits is closely guarded.

Watch a video of Soil Judging in 30 seconds.

https://youtu.be/VqwOopaLUwM

"The contest location is a big secret," says Yamina Pressler, a soil ecologist and co-coach of the CSU team who now works as a postdoctoral research associate at Texas A&M University. "Aside from when and where we should meet to leave for the competition, we don't know anything about the [judging] sites."

The competitive portion of the event is broken into an individual competition—up to four students from each school can compete—and a team competition in which all students participate and collaborate with their teammates.

Students are judged on how closely their soil descriptions match the descriptions provided by local NRCS professionals and the school coaches, all of whom are soil scientists themselves. At the end of the week, winners are announced for the individual, team, and overall (individual plus team) categories.

2019 Winners

After a week of exploring the California soil and Sun, the University of Maryland emerged as the 2019 overall champion, narrowly edging out Virginia Polytechnic Institute and State University (Virginia Tech). One of Virginia Tech's students captured the individual title, and the University of Nebraska–Lincoln claimed the team title.

Although everyone wants to win—the University of Maryland students jumped for joy at hearing their names called—the point of the contest is not to crown a champion but to promote soils and provide students with hands-on experience. Because the event is so intensive, soil judging is one of the best ways for students to learn about soils and pedology, says Pressler.

"Far and away, the best part of being involved in soil judging is that it's an excuse to travel the country and see different soils," says Gordon Rees, an assistant professor of soil science at Cal Poly and one of this year's hosts. "The students develop skills that can be applied anywhere but get to do so in a new place."

And though there are no awards for best soil, one, in particular, stood out.

"The first day in San Luis Obispo, we went to an avocado grove and a lemon grove," says Pressler. "And then there was one soil that looked like an Oreo cookie. It was awesome."

—Aaron Sidder (@sidquan), Science Writer

Citation: Sidder, A. (2019), Making the grade: A week at the national soil judging contest, *Eos, 100,* https://doi.org/10.1029/2019EO122395. Published on 30 April 2019.

You Say Soil Mottles; I Say Redoximorphic Features

This article is reproduced verbatim from *Onsite Installer* and includes links to related articles in the same magazine. *Onsite Installer* serves those who design, manufacture, engineer and install septic systems serving both residential and commercial onsite wastewater treatment applications.

You don't have to be a soil scientist to evaluate soil coloration found in the field. We'll teach you the basics.

- By Jim Anderson and Dave Gustafson
- May 2019

As we move into the meat of our "field" season, we've had a few questions about identifying redoximorphic features in the soil and how they relate to the presence of seasonal or permanent zones of saturation that are considered limiting soil layers. Identifying features related to saturated soil zones sets the baseline for determining separation distance from the bottom of the system infiltration surface to the limiting layer.

These features at one time were referred to as soil mottles. However, this created confusion because soil mottles referred to any occurrence of color differences within a soil horizon giving the horizon a mottled appearance. For identification of saturated conditions, specific kinds of "mottles" needed to be recognized.

Understanding how redoximorphic features form requires some knowledge of the chemistry and microbiology involved. We do not expect you are or need to be chemists or microbiologists, but it is good to know how the features form. The knowledge can help you sort out if the features you identify in the field are due to soil saturation.

PAINTING THE SOIL

In subsoil horizons, iron oxide minerals give the horizons red, yellow, brown or orange coloration. Manganese oxide minerals produce black colors. These mineral oxides naturally coat the surfaces of individual sand, silt and clay particles. Think of it as a coat of paint on the surfaces of the particles. Without this paint, the particles would be gray in color.

Red, yellow, brown and orange colors occur when iron is in its oxidized state — that is, in the presence of oxygen. Black colors occur when manganese is in its oxidized state. These minerals can be chemically reduced in soils under certain conditions. This means that the iron and manganese ions accept electrons from a source other than oxygen, and in soils, this is usually from organic matter being decomposed by bacteria.

Related: How to Pick a Soil Loading Rate

When a soil is well-aerated (not saturated), bacteria consume and reduce oxygen in the air-filled pores. When a soil is saturated, the bacteria consume and reduce the oxygen dissolved in the water. When the oxygen is gone, the bacteria continue to break down the organic matter but they also reduce nitrate-nitrogen and the manganese and iron oxides. The chemical reactions occur in sequence, so oxygen goes first, followed by nitrate, manganese and iron.

When iron and manganese are reduced, several things begin to happen. Iron and manganese dissolve in water, soil color changes to gray, and iron and manganese move with the soil water to other parts of the soil horizon or are leached from the soil. The term redoximorphic refers to the reduction and oxidation chemical reactions and the resulting appearance or morphology of the soil horizon.

When the soil becomes unsaturated and aerated again, areas of the soil where the iron and manganese vacated appear gray due to the natural color of the sand, silt and clay particles mentioned above. The areas where iron and manganese have migrated to are red, brown, yellow, orange or black in color. This pattern provides a mottled appearance to the soil horizon and reflects the fact that the soil is saturated for periods of time long enough for the chemical reactions to occur.

While the length of time it takes for the reaction to occur varies from place to place, it implies for our purpose of identifying a limiting soil layer that saturation occurs for a long enough period that it will interfere with acceptance and treatment of septic tank effluent.

EVALUATION

Three major kinds of features can be recognized in the field by an experienced soil scientist or site evaluator. We maintain that installers and service providers with a knowledge of soils in their area can also identify these features. For this reason, we regularly conduct field workshops or activities to evaluate these features.

Related: The Scoop on Redoximorphic Features: Part 2
The three kinds of features are redox concentrations, redox depletions and reduced matrices.

Redox concentrations are bodies where iron and manganese have accumulated. These accumulations can have several forms including nodules or concretions, soft masses or pore linings. Nodules and concretions are firm to extremely firm, irregularly shaped bodies with diffuse boundaries. Soft masses are just that irregular and soft within the inside (or matrix) of the soil structural units or peds. Pore linings are where the accumulations are along a root channel or crack.

Redox depletions are areas vacated by the mineral oxides either along old root channels or in the matrix of the peds.

Reduced matrices have the low soil colors in place but when removed from the profile and exposed to oxygen will change color as iron and manganese in the soil is oxidized. This type of condition usually means the soil is most often saturated and water movement through the soil is very slow because the iron and manganese have not leached out of the profile.

With this background information on formation and kinds of redoximorphic features, upcoming columns will discuss interpretation of what is seen in the field and relate the interpretation to some of the questions we are most often asked about redoximorphic features.

'Mountain of Sand' Spread Across Nebraska Farms After Floods

We've been hearing for weeks now about the tremendous flooding that has occurred in the country's mid-section along the Arkansas, Missouri, Mississippi, and their smaller tributaries. The flooding may be ephemeral but the damage to some of our most productive soils is not. The following Associated Press article is taken verbatim from the May 13 Issue of Ag Web Farm Journal.

Ryan Ueberrhein holds a handful of sand as he stands on a pile of it that once covered his field Monday, April 29, 2019, in Valley, Neb. The sand, which he is having hauled away, was dumped there by floodwaters in March.

By **Associated Press**

Nebraska landowners are seeking new solutions for a millions-year-old phenomenon.

Tons of sand, sediment and silt — some in dunes as high as 10 feet — have been scattered across the eastern half to two-thirds of the state by the March flooding.

In some areas, washed-out cornstalks are 3 to 4 feet deep. Tree limbs are in piles and topsoil has been washed away.

"We have a mountain of sand piled up," Valley farmer Ryan Ueberrhein said to the Omaha World-Herald.

Sediment from Nebraska's rivers and streams has been deposited on nearby flooded land for millions of years. Now U.S. Department of Agriculture officials, University of Nebraska-Lincoln Extension specialists and extension educators are trying to figure out what to do with it.

They're racing against the clock because farmers need to plant and ranchers need grass pastures to graze their cattle.

Sixteen percent of the corn crop is planted, which is slightly ahead of last year but behind the 23% five-year average.

Some ranchers may have to use the land they can, supplement their herds with hay to make up for the loss in production and deal with sand issues later in the summer.

Eight inches or less of the sand-sediment mix can usually be tilled into the soil with the right equipment, extension educator John Wilson said. But for others with much larger amounts, it may require removing sand and stockpiling it along the edge or in the corners of fields. In extreme cases, it might be too costly to do anything but leave it.

"If you have 3 to 5 feet of sand, that might be the new normal," said Brad Schick, an extension educator based in Nance County.

That's where people like Daren Redfearn come in. He's an extension forage specialist at UNL, and he and his co-workers are looking into what can be planted to stabilize the massive amounts of sand that can't be moved.

"Especially those that border rivers and waterways, so they can serve more as a levy next time something like this happens," he said.

There is no recipe to speed the process, he said.

If it's too costly or labor intensive to remove the sand, native prairie grasses could be one answer, providing stabilization.

Landowners could consider planting annual forages for a temporary fix this summer, Wilson said, then work on sand issues before doing a dormant seeding late in the fall or seeding next spring.

"Establishing anything in the 'sand dunes' this year will be challenging because of the soil texture and lack of soil structure and organic matter," Wilson said.

Redfearn said owners need to think about their plans for the affected areas, both in the short term of five years and longer.

"The obvious solution was to haul it off, but if that's not affordable," he said, "then what is the next best thing to do, given what you're working with?"

Information from what was done after the floods of 2011 is available for landowners, but it doesn't cover all of the same issues.

It's going to be a learning experience for everyone, Ueberrhein said. "This is all new to me."

The 34-year-old, who farms about 2,000 acres with his dad, brother and a neighbor, has sand and cornstalks washed up on his land from the Elkhorn and Platte Rivers. And trash.

"Chairs, shelves, soccer balls, a sled, 2x4s, 2x6s," he said. "You name it and we can probably find it. It's just a mess. We're trying to figure out what to do with all that."

Anything that has landed on a property now belongs to the owner, and they must find a home for it.

It's illegal to dump any type of fill material into U.S. waters without permission from the U.S. Army Corps of Engineers. There are exceptions, so the best approach is to call a corps regulatory office and talk to a project manager about the need for authorization.

Ueberrhein said 5 to 10 acres on one 80-acre piece of his land was covered in sand 2 to 4 feet deep. He hired Barger Grading of Bennington to bulldoze the sand into piles. After removal, it will be used for filler for other flood projects.

The sand was deeper than expected, making the job more expensive, but Ueberrhein said it had to be removed so he could properly plant his corn.

He has no idea what the final price tag will be.

"It's not going to be cheap," he said. "You have multiple trucks, a bulldozer and a loader. It gets pricey in a hurry. It's an extra expense you hadn't planned on."

Other farmers along the Missouri River have piled up or wind-rowed sand along the edges of a field or in a pivot corner and won't haul it away.

"They sacrificed a few acres of production so they could farm the rest of the field without the sand deposits," Wilson said.

Ueberrhein said he's one of the lucky ones. He was recently able to start planting, unlike many others across the state.

While the situation has been difficult, Ueberrhein said everyone he knows is approaching it with a positive attitude.

"I tell you, it's building some character," he said. "You get stressed out. You just have to take a step back and breathe. You can't control Mother Nature. This is what it is, and you have to fight it head on. That's what we are doing."

Train a Farmer, Feed a Nation: Launching a New Ag University in Ethiopia

Some of our AOP members may recall a "not-so-long-ago" request from Dr. Warren Dick, Soil Science Professor Emeritus at Ohio State, for assistance with mapping the soils of a new agricultural university in Ethiopia. His efforts to start this university were recently featured on the cover of *CSA News Magazine*. The article, "Train a Farmer, Feed a Nation: Launching a New Ag University in Ethiopia" that accompanies the cover is available online at https://dl.sciencesocieties.org/publications/csa/articles/64/6/4 and is reproduced verbatim here. *CSA News* is a magazine of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America.

By: Tracy Hmielowski

"Train a Farmer, Feed a Nation"—this is the motto of the Bethel Environmental and Agricultural University and Training Center. The Bethel Environmental and Agricultural University and Training Center, or BEAUTC, is a new university based in Woliso, Ethiopia and is the brainchild of ASA and SSSA member Warren Dick. Dick first visited Africa as

an undergraduate, and years later, a conversation with a fellow soil scientist from Ethiopia made it clear there was a need for quality agricultural education in Ethiopia. Ethiopia has a rapidly increasing population, and with limited land for farming, it suffers from food insecurity. By educating farmers locally, and focusing on local needs, local crops, and sustainable practices, there is potential to improve many communities in this nation.

However, starting a new university is no small task. Dick has slowly developed relationships with colleagues in Ethiopia, traveling multiple times to Africa to discuss the potential for this university. In 2012, he organized a board of directors for Bethel Agricultural Association (BAA) made up of individuals from both the United States and Canada with both academic and commercial backgrounds. This was the first step toward establishing that BEAUTC University would be under complete Ethiopian control, and the BAA board operates as sort of a development organization in support of BEAUTC.

Gobena Huluka is originally from Ethiopia and has been a board member since its inception. “It is my passion to empower farmers to do better regardless of their enormous challenges because they feed the nation,” he says. Huluka, an associate professor in the College of Agriculture at Auburn University, sees BEAUTC as a way to contribute to his home country and support African agriculture in general.

The BAA board in the United States works in cooperation with a separate, fully government approved non-profit board in Ethiopia and administers the BEAUTC project on a day-to-day basis. One responsibility of the BEAUTC Project Manager in Ethiopia, Teddy Amuma, is to coordinate activities with the federal and regional government and to work with the local community. Amuma joined the project to make a difference in the lives of farmers in Ethiopia. He recognizes some of the negative connotations associated with being a farmer in Ethiopia and sees the university as an opportunity to change how farmers are viewed as well as helping communities gain greater food security.

With leadership established, the next step was to purchase land where the university will be located. Dick says that Amuma was key in brokering this deal with the local community. “Farmers in Ethiopia are very suspicious when you talk to them about how you intend to take their land for any project,” Amuma says. “My greatest challenge was to convince the farmers

about the importance of our project and to ask them to leave their land so that our project could open a university and training center." In 2018, BEAUTC was successful in gaining local support and purchased 32 acres of land for the university.

Dick explains that the next steps to actually offering university courses and credits are to sponsor agricultural- and environmental-themed workshops, create a demonstration farm, develop curriculum, and provide support for sustainable and innovative agricultural businesses. Several workshops have already been conducted on soil quality and sustainable agricultural practices and were enthusiastically received. Nevertheless, to continue to move this project forward, both national and international partners will be necessary.

"By teaching in place, we can build the local knowledge," Dick says, adding that he hopes that the university will lead to economic development and innovation that stays in Africa. Amuma sees BEAUTC as a way to bring new technology and techniques to farmers in Africa and to help farmers use the land in a responsible and sustainable way as there is currently a lack of modern agriculture in many parts of the country. "In my humble opinion, I believe our project will help our community and the rest of Africa to bridge the gap," Amuma says.

"It is time our [Societies] create an ASA, CSSA, and SSSA without boarders to impact food production through agricultural projects like BEAUTC," Huluka says. Members of the Societies have knowledge that can change food production not only in the region where they do research, but across the globe. While Dick has taken an extraordinary step in starting BEAUTC, there is potential for ASA, CSSA, and SSSA members to have global impacts on a smaller scale. They may be able to teach abroad for a semester, collaborate with international colleagues, or share information with a broader audience to help advance global solutions.

To learn more about BEAUTC, visit: www.bethelagriculture.org.

Footnotes

- doi:10.2134/csa2019.64.0601

FOR SALE – Soil Sampling and Testing Equipment

Purchased new from manufacturer in 2017 – used only one field season
2 – **AMS Soil Auger Kits**. Includes 3 ¼ in. HEX Quick Pin(QP) Regular Auger; 1 ½ in. x 18 in. Triple Lead Flighted Auger with New Male HEX QP Fitting; 4 ft. HEX QP Extension; and Hex QP Ratchet Cross Handle.
2 – **JMC Backsaver Soil Probes.** Includes stainless steel handles, 18 in. dry sampling tubes, special tube cleaners & pouches.
4 – **AgriDrain 4 ft. Heavy Duty Probes**. Ideal for probing drain tile and other subsurface items.
3 – **Dickey-John Soil Compaction Meters (Penetrometers)**. Includes ½ and ¾ in. cone tips; 30 in. stainless steel probe with 3 in. incremental depth markings; rugged molded housing and handle; and color coded stainless steel dial with three compaction ranges (0-200 psi, 200-300 psi, and 300+ psi).
1 – **FieldScout SC 900 Soil Compaction Meter (Penetrometer) Kit from Spectrum Technologies**. Includes ½ and ¾ in. cone tips; takes compaction readings to a depth of 18 in.; ultrasonic depth sensor captures readings in 1 in. increments; penetration resistance measured by internal load cell; connects to any GPS receiver with serial output; equipped with internal data logger and RS-232 port; records 772 measurements; includes carrying case.

Contact AOP Member Mark Wilson if interested. mwilson@landstewards.com (c) 614-506-7846

AOP Consultant List

The Association of Ohio Pedologists maintains a list of Certified Soil Scientists who are currently available for soil consulting. The list may be viewed on the AOP website at: https://www.ohiopedologist.com/consultant-list.html Certification *must* be through the Soil Science Society of America, and inclusion on the AOP list is voluntary. If you are SSSA-certified and would like to be added (or removed) from the list or if modifications are required to your current listing, please respond to the following:

Name:_____

Action Requested:

1. Please remove my name and contact information from the list _____

2. Please add my name and contact information to the list _____

   Provide the following information, as appropriate:
   Name: _____
   Business Name: _____
   Address: _____
   _____
   _____
   Email: _____
   Telephone No: _____
   Facsimile No: _____
   Website URL: _____
   Degrees and Certifications: _____
   _____
   Usual Service Area: _____

3. Please modify my existing personal/business information as shown above ___

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