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OHIO STATE UNIVERSITY EXTENSION

NORTHEAST OHIO AGRI-CULTURE NEWSLETTER

Your Weekly Agriculture Update for
Ashtabula, Portage and Trumbull Counties

Nov 29, 2022

In This Issue:

Hello Northeast Ohio Counties!

We hope everyone had a great Thanksgiving and enjoyed our beautiful fall weather!

I had a chance to get out and look at some wheat while we had nice weather last week. The early planted wheat fields look great!

Have a great week and stay safe!

Lee Beers
Trumbull County Extension Educator

Andrew Holden
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Protecting the Farm from the Risk of Long-Term Care

By: Peggy Kirk Hall,
Source: https://farmoffice.osu.edu/blog/tue-11222022-1104am/protecting-farm-risk-long-term-care

Long-term care costs are a threat to family farms. In fact, we predict that long-term care costs are the biggest financial threat to farm families, even more so than federal estate taxes. That's because long-term care can affect every farm--and when cash or insurance runs out, farm assets may have to be sold to pay for long-term care. With an increasing elderly population and rising health care costs, the financial pressure of long-term care on family farm succession will probably grow in future years.

What can farm families do to protect farm assets from the risk of long-term care? Our latest publication by attorney Robert Moore, *Long-Term Care and the Farm*, addresses this question. The publication begins with an important first step: understanding long-term care risk. What is the chance that a farmer will require long-term care, what kind of care is most common, and what how much will it cost? Robert presents data and statistics that help us predict the expected type, length, and costs of long-term care services a farmer might require.

Once we assess long-term care risk, the next important question is how to pay for long-term care while keeping farm assets secure. Robert explains how Medicare and Medicaid programs can apply to long-term care costs. He then presents several legal strategies to mitigate long-term care risk and protect farm assets. The guide wraps up with a process a farm family can follow to assess long-term care risk for their individual situation.

It's possible to keep family farmland and the family farm businesses safe from the risk of long-term care. If long-term care is a concern for your farm family, be sure to read this important new publication and talk with an agricultural attorney about protection strategies. The publication is available at no cost through our funding partnership with the National Agricultural Law Center and the USDA National Agricultural Library. Read *Long-Term Care and the Farm* here.

Study: Turning Wastewater into Fertilizer Is Feasible and Could Help to Make Agriculture More Sustainable

By: Britt Faulstick
Source: https://drexel.edu/news/archive/2022/November/wastewater-ammonia-recovery

The wastewater draining from massive pools of sewage sludge has the potential to play a role in more sustainable agriculture, according to environmental engineering researchers at Drexel University. A new study, looking at a process of removing ammonia from wastewater and converting it into fertilizer, suggests that it's not only technically viable, but also could help to reduce the environmental and energy footprint of fertilizer production — and might even provide a revenue stream for utilities and water treatment facilities.

A Sustainable Nitrogen Source

The production of nitrogen for fertilizer is an energy-intensive process and accounts for nearly 2% of global carbon dioxide emissions. In the last several years researchers have explored alternatives to the Haber-Bosch nitrogen production process, which has been the standard for more than a century. One promising possibility, recently raised by some water utility providers, is gleaning nitrogen from the waste ammonia pulled from water during treatment.

"Recovering nitrogen from wastewater would be a desirable alternative to the Haber-Bosch process because it creates a 'circular nitrogen economy,'" said Patrick Gurian, PhD, a professor in Drexel's College of Engineering who helped lead the research, which was recently published in the journal *Science of the Total Environment*. "This means we are reusing existing nitrogen rather than expending energy and generating greenhouse gas to harvest nitrogen from the atmosphere, which is a more sustainable practice for agriculture and could become a source of revenue for utilities."

A Cleaner Way to Clean

Under the Clean Water Act of 1972 municipal water treatment facilities have been challenged to meet water quality standards for water that they discharge into waterways. Increasingly ammonia is seen as both a concern for aquatic environments as elevated levels of ammonia can result in overgrowth of vegetation in streams and rivers which can endanger fish species. The options for removing ammonia are generally time and space consuming and can be energy-intensive undertakings.

One option being explored by several facilities in North America and Europe is a process called air-stripping. It removes ammonia by raising the temperature and pH of the water enough to convert the chemical into a gas, which can then be collected in concentrated form as ammonium sulfate.

But deciding on making the investment to convert to air-stripping requires a complex study – called a lifecycle analysis — of its technological and financial viability.

Exploring the Option

The team, led by Gurian and Sabrina Spatari, PhD, from Technion Israel Institute of Technology, regularly perform these analyses to take stock of the full environmental and economic impact of various options for recycling and reuse of waste or side-stream products as sustainable solutions. Their analysis of this wastewater scenario suggests there is a complementary relationship that could result in a more sustainable path for both farmers and water management authorities.

“Our analysis identifies a significant potential for environmental mitigation and economic benefit from implementing air-stripping technology at wastewater treatment plants for producing ammonia sulfate fertilizer,” they wrote. “In addition to ammonia sulfate production as a marketable product, the benefit of reducing the ammonia load in the side-stream before it is recycled into the wastewater stream at the wastewater treatment plant provides an additional justification for adopting air-stripping.”

Using data from Philadelphia’s water treatment facility and several others across North America and Europe, the team conducted its lifecycle assessment and economic feasibility studies. They looked at factors ranging from the cost of installing and maintaining an air-stripping system, to the concentration of ammonia and flow rate of the wastewater; to the sources of energy used to drive the collection and conversion process; to the production and transportation cost and market price of the fertilizer chemicals.

Promising Results

Findings of the life-cycle analysis show that air-stripping emits about five to 10 times less greenhouse gas than the Haber-Bosch nitrogen-producing process and uses about five to 15 times less energy.

From an economic perspective, the overall cost of producing fertilizer chemicals from wastewater is low enough that the producer could sell them at a price more than 12 times lower than Haber-Bosch-produced chemicals and still break even.

“Our study suggests that recovering ammonia can be cost-effective even at low

concentration,” they write. “Although high ammonia concentration is environmentally favorable, and can simultaneously support marginal production of ammonium sulfate with lower environmental impact, particularly for life cycle energy, greenhouse gas emissions, and several human and ecosystem health indicators, compared to the Haber-Bosch production.”

In addition, the study suggests that water treatment facilities may enjoy energy savings by air-stripping the ammonia to reduce levels before the water it reenters the waste treatment process. This is because it would cut the time and processing needed to treat the water and fits in well with softening processes that help to slow chemical deposition on the treatment plant infrastructure.

While the team acknowledges that air-stripping would churn out fertilizer in smaller amounts than the industrial Haber-Bosch process, being able to collect and reuse any quantity of resources helps to improve the sustainability of commercial agriculture and prevents them from becoming water pollutants.

“This indicates that air-stripping for recovery of ammonium sulfate could be a small part – but an important step – toward recovering and reusing the massive amount of nitrogen we use to sustain global agriculture,” Spatari said. “And, significantly it presents an alternative for chemical production that does not have the same level of deleterious environmental and human health effects as the current process. This research suggests that water utility providers could also consider investing in technologies that would capture phosphorous and recycle it for agricultural use.”

Drexel doctoral student Saurajyoti Kar, currently at Argonne National Laboratory, was first author on this contribution. In addition to Gurian, Kar and Spatari, Rajveer Singh, from Drexel University; and Adam Hendricks, Paul Kohl, and Sean McKelvey, from the Philadelphia Water Department, contributed to this research. The research was supported by the Philadelphia Water Department.

Read the full paper
here: https://www.sciencedirect.com/science/article/abs/pii/S0048969722065986

Berks Center Examines how Telephone Poles can Help Stop the Spotted Lanternfly

By: Mackenzie Cullen
Source: https://www.psu.edu/news/berks/story/berks-center-examines-how-telephone-poles-can-help-stop-spotted-lanternfly/

WYOMISSING, Pa. — The Penn State Berks Center for the Agricultural Sciences and a Sustainable Environment (CASSE) is studying the role that telephone poles can play in monitoring and eradicating the invasive spotted lanternfly.

The CASSE continues to be one of the main research sites surveying effective procedures in the control of the invasive planthoppers through support from both the U.S. and Pennsylvania departments of agriculture, as well as other grant funding.

Spotted lanternflies are drawn to tall objects like skyscrapers, gas pumps, pillars and trees, according to John Rost, a research technologist in the horticulture department at Penn State Berks. The lanternflies use these perches to gain their bearings before searching for a place to feed.

At the CASSE, telephone poles were used as monitoring devices to test methods of eradication. In the study, eight poles were set up in a straight line to keep a replication. Two types of traps were installed on each pole: a top trap with a sealed barrier except for an opening at the bottom and a section of pole wrapped with pesticide-impregnated netting, which the insects encountered on their journey to the top. At the bottom of the pole there is a catch trap to collect any dead, falling lanternflies.

Four of the poles were outfitted with white netting, like the type that is used in tobacco houses, while the other four had black netting, which is typically used for mosquitoes, explained the researchers.

Figure 1 Eight poles were set up in a straight line with two types of traps on each pole: a top trap with an opening at the bottom and a section of pole wrapped with pesticide impregnated netting. Four of the poles had white netting, while the other four had black netting. The traps were also placed at varying heights on the poles. Credit: Samantha Bower / Penn State. All Rights Reserved.

Rost explained that insects latch on to the poles, and then climb to the top where they encounter the top trap covered with netting, which exposes them to an insecticide.

“We’re trying to see if height matters, so we have two poles [outfitted with traps with each type of netting] at mid-height and we have the other two at the top,” Rost said. “We’re finding that we lose fewer lanternflies in the drop-down at mid-height because they have a shorter drop.” He said that lanternflies that die on the top poles tend to get carried away by the wind.

According to Rost, the researchers have noticed a difference in the effectiveness between the two trap materials. The mosquito netting was more effective in eradicating the lanternflies, causing them to die and fall within a couple of minutes. The tobacco netting required a longer contact time before the lanternflies succumbed and fell into the trap.

Figure 2 Each telephone pole had a top trap with a sealed barrier except for an opening at the bottom. Half had white netting, like the type that is used in tobacco houses, and half had black, which is typically used for mosquitoes. Credit: Samantha Bower / Penn State. All Rights Reserved.

In advance of the study, individual lanternflies were treated with a fluorescent dye. This helped the research team determine if they are catching the insects being released at set intervals from the poles, and how attractive the poles are to lanternflies. Sorting out the dyed lanternflies from the natural population, also helped the researchers to determine whether the traps were attracting more females or males.

“We find it varies from early to late in the adult life cycle stage. It’s mostly males in the earlier movement of the adults because they seem to be the first ones to move out. Then we find it to be females towards the end stages, because they’re looking to lay the eggs at that point,” Rost said.

The telephone-pole study is in its first year at the CASSE. Brian Walsh, Penn State Extension spotted lanternfly educator, assisted with the study; he has been doing pole studies for three years in the local area.

Rost said that when it comes to spotted lanternfly research, it can be challenging to keep track of the behavioral patterns because of how quickly the insects adapt.

“Every time we think we see a pattern coming up, and we have collected two years of consistent data, it’s completely thrown off track by the third year. So we’re trying to find out if it reverts to the old cycle,” he said.

Adult spotted lanternflies gather in large groups to feed on a favorite or “hot” tree before moving on to the next, said the researchers, who are also trying to figure out why the insects get so attached to one specific tree, and what factors play a role in their fixation.

About the spotted lanternfly

The spotted lanternfly, Lycorma delicatula, is an invasive insect that came to Berks County from Asia in 2014. Their prominence has since spread along the east coast from Connecticut to Georgia. Spotted lanternfly feeding causes stress on certain plants and localized damage; their feeding does not necessarily kill other plants.

Spotted lanternflies hatch towards the end of spring in May or June, within a week or two depending on the climate of an area. Once the lanternflies hatch, there are four instars — or development stages — that they go through before becoming adults. With each instar, the number of lanternflies congregating together increases.

“At first, when they’re about the size of a tick, they’re spread throughout [the area], feeding on anything they come into, and are always on the move,” Rost said. “As they get more mature, you’re going to start seeing a whole lineup on one plant, but come the next day, they move on to a different plant.”

During the second and third instar, nymphs grow in size and keep their black and white spots. By the fourth instar, they take on a reddish color.

“As they get to that fourth instar, then they’re starting to congregate on woody plants like vines, walnuts, maples, sumac and trees of heaven. By the time they hit the adult stage, that’s when they’re the most visible and what everybody recognizes,” he continued.

Figure 3 In past studies, Rost found that insecticides that have either bifenthrin or dinotefuran have been effective in eradicating the SLF when used according to the label. Credit: Samantha Bower / Penn State. All Rights Reserved.

In past studies, one of the most significant findings that Rost and other researchers at the CASSE said they found is which insecticides are the most effective in killing the SLF but will be least effective in harming non-target species. The researchers tested different application methods on peach trees, grape vines and trees of heaven, analyzing the effects on lanternflies according to how and when insecticide is applied to the plants. Currently, insecticides that have either bifenthrin or dinotefuran have been effective when used according to the labels.

About the Center for the Agricultural Sciences and a Sustainable Environment

The Penn State Berks Center for the Agricultural Sciences and a Sustainable Environment was formally established in 2016 for the purposes of conducting agriculture, horticulture, plant and soil ecology, rhizosphere, microbiome and turfgrass science research, as well as to support teaching and outreach efforts on campus. The center also participates in campus sustainability initiatives through the composting program.

2022 Ohio Maple Day

Source: https://u.osu.edu/vegnetnews/2022/11/01/2022-ohio-maple-day/

We are fast approaching the date for the **2022 Ohio Maple Day** event. Join us on **Dec. 10th** at Ashland University's John C. Meyer Convocation Center for a jam-packed program on all things maple. Updates on red maple research from both Ohio State's Gabe Karns and the University of Vermont's Proctor Maple Research Center's Abby van den Berg. Add to this other talks on reverse osmosis, marketing, and insects impacting maple trees.

A maple-themed lunch and a vendor room that features a variety of maple equipment dealers, consulting foresters, and other associated equipment help round out the day. There are also SAF continuing education credits available for the program.

You can register **here**

2022 Ashtabula County Plat Book Available

The updated 2022 version of the Ashtabula County Plat Book is available for $25 + tax at Ashtabula County - OSU Extension Office located at 39 Wall Street in Jefferson. This full color edition makes the perfect gift for the hunter, hiker or outdoorsman! Traditional landownership maps by township and range, a landowner index for easy cross referencing, and other county information are all available in the new plat book. Premium wall maps are also available. Visit mappingsolutionsGIS.com for digital versions of Ashtabula County landowner maps. Mapping Solutions is the publisher. Proceeds from the sale of the books benefit the 4-H program.

Limited 2019 books are also available ON SALE for $10 OFF the original price of $25 + tax. For more information contact the office at (440) 576-9008.