

The Amboy News

The Mendota Reporter The Wednesday, September 30, 2020

THE FARMER'S REPORT

Illinois Department of Labor stresses farm vehicle safety as busy harvest deason begins

SPRINGFIELD – The agricultural industry is one of the most dangerous with a work-related death rate of 23 deaths per 100,000 workers, according to the U.S. Bureau of Labor Statistics. And the fall harvest season is one of the busiest and most dangerous times for agricultural workers.

Recognizing the dangers of harvest season, the National Safety Council each year designates the third week of September as National Farm Safety and Health Week -- Sept. 20-26 -- which this year emphasizes the need for farm vehicle and rural road safety. This year's theme is "Every Farmer Counts."

"September is tractor season in Illinois," said Michael Kleinik, director of the Illinois Department of Labor. "This is the time of year when it is so important for both farmers and motorists to be patient and share the roads. We want everyone to head home to their families safe and sound at the end of each day."

Vehicle safety is an especially important focus this time of year. Tractor overturns are the leading cause of fatalities in the agriculture industry, according to the Occupational Safety and Health Administration. These accidents result in about 130 deaths each year nationwide, according to the National Ag Safety Database.

While tractor roll-over accidents most often occur on the farm, roadways also pose a major safety hazard. Too often a non-farm vehicle attempting to pass causes a collision before the tractor or farm implement can finish a left-hand turn onto a rural road or into a field. Many collisions occur simply because the driver fails to reduce speed for the slower moving farm implement.

"We all appreciate the important work our farmers do, and this time of year it is vital that we support and protect them by slowing down when you approach farm vehicles on rural roads," said Kleinik.

Visibility is also a key to safety on the roads. All agricultural vehicles using the public roadways must display the fluorescent orange Slow Moving Vehicle triangle. Additionally, tractors and other self-powered farm vehicles must have proper lighting. According to Illinois law:

• Lighting is required from 30 minutes before



sunset to 30 minutes after sunrise.

• There should be two white lamps on the front of the vehicle, visible from at least 1000 feet to the front of the vehicle.

• There should be two red lamps on the rear of the vehicle, visible from at least 1000 feet to the rear of the vehicle.

• There should be at least one flashing amber signal lamp on the rear of the vehicle, mounted as high as possible and visible from at least 500 feet, which can be used during daylight as well.

Drivers should remember

that farm vehicle operators have limited visibility to the rear. Anyone passing such a vehicle needs to use extreme caution.

Modern farm equipment provides effective safety devices if they are used properly. Death and serious injury from tractor roll overs can be prevented by roll-over protective structures - a roll bar or cage designed to provide a safe space around the driver.

But too often workers fail to use a vital part of this safety device – a safety belt. Unless the operator is buckled in, the roll-over

protection cannot do its job and an injury or fatality can still occur.

Another key to harvest-time safety is being healthy and alert. The temptation during harvest season is to keep pushing until the work is done. But that can be a recipe for disaster. Safety experts stress three words for agricultural workers to stay safe during the busy harvest days - Rest. Nutrition. Hydration.

Take regular breaks to stretch your legs - these breaks can serve the dual purpose of taking time to make a quick inspection of your tractor or combine. Also, your tractor isn't the only thing that needs fuel. Make sure to eat and drink fluids regularly to help stay alert.

The National Education Center for Agricultural Safety will offer free safety webinars each day of the week of September 20-26. You can find more information and register for the webinars --topics include farm vehicle safety, respiratory protection, farmer mental health, child agriculture safety and more - at https:// www.necasag.org/nationalfarmsafetyandhealthweek/



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Curbing phosphorus losses: There's an App for that

WASHINGTON — Designing an on-farm system for removing phosphorus in field runoff or subsurface drainage could become easier to do thanks to the "P-Trap," a new software program from Agricultural Research Service (ARS) scientists and their collaborators.

In agricultural production systems, phosphorus is a critical nutrient for optimal plant growth, health and yield. But phosphorus that leaves agricultural fields in runoff or drainage water can end up in water bodies like lakes, streams and rivers, compromising their quality, fueling algal blooms and imperiling aquatic life as well as recreational activities. Management practices and technologies that prevent phosphorus loss is vital to maintaining environmental quality. One promising technology is an engineered system that removes phosphorus

from runoff or drainage water as it leaves a field.

There are a variety of ways to design, build and install a phosphorus removal system. However, deciding which system is best for a specific farm operation or crop field configuration can be daunting, noted Chad Penn. He is a soil scientist at the ARS National Soil Erosion Research Unit in West Lafayette, Indiana, who is conducting intensive field research on phosphorus removal systems.

The P-Trap ("Phosphorus Transport Reduction") software streamlines the process by asking the user to enter four basic categories of information, starting with a drop-down menu offering different design options. The program then calculates specifications for building the structure based on data the user entered, including expected water-flow rates, annual volume, dissolved phosphorus concentration in water, drainage ditch depth and slope, pipe diameter and desired phosphorus removal rate.

The P-Trap isn't just a decision-aid, though; it can also evaluate the effectiveness of an existing design that's already in use and offer recommendations to improve it.

Penn noted that regardless of design, phosphorus removal structures are intended for use on fields with a legacy, or long history, of phosphorus application in fertilizers or animal manures that has resulted in an accumulation of soil phosphorus to concentrations greater than crops need. While reducing excess soil phosphorus through better agronomic management is critical to long-term sustainability, using phosphorus removal structures can help prevent phosphorus from leaving fields as this legacy phosphorus is reduced.

The removal systems are intended to capture dissolved phosphorus, a form that can escape crop fields via runoff or tile drainage more readily than particulate (or sediment-bound) forms of the nutrient. Dissolved phosphorus that ends up in surface waters also is more readily available to algae, whose growth, death and decay can compromise water quality and cause other harm.

In addition to creating the P-Trap software, Penn also designs, installs and evaluates phosphorus removal systems—along with different materials in the systems that actually bind up the nutrient. In Highland Township, Ohio, for example, he is conducting a demonstration trial of a septic-tank-based design that uses a bed of iron oxide to capture phosphorus.

According to Penn, the system has the capacity to service a 20-acre area of crop

land and remove about 40 percent of the dissolved phosphorus that can leave that area over a 10-year period. After that, the iron oxide media can be "re-charged" to capture additional phosphorus.

Penn's overarching goal is to improve the systems and get their phosphorus removal costs down to \$200 per pound or less—similar to what a waste-water treatment plant can spend on removing the nutrient.

Kevin King of ARS's Soil Drainage Research Unit in Columbus, Ohio; Margaret Kalcic of The Ohio State University, and Jessica D'Ambrosio and Stephanie Singer of The Nature Conservancy are among Penn's collaborators on the effort.

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Space Nematodes: A Giant Leap for Interplanetary Agriculture

WASHINGTON, DC

-In a successful return-tospace mission, research study results indicate that beneficial insect-killing nematodes (small round worms) can be used in the future for natural control of insect pests when humans are growing crops in space. The research objective was to study entomopathogenic (insect-killing) nematodes (EPNs) foraging and infection dynamics in space onboard the International Space Station (ISS) between December 2019 and January 2020.

These beneficial roundworms may have "what it takes" for controlling pest insects that threaten crops grown aboard during longterm human missions in space. That's the implication of findings from experiments conducted aboard the ISS and published in the journal npj|Microgravity. EPNs are insect parasites used to naturally control insect pests that damage crops, that's why investigating the efficacy of EPNs in a unique environment like the one provided by the ISS (e.g. an apparent state of weightlessness) could help establish successful agriculture and plant protection in space.

Here on Earth, insects have great abilities for finding, eating and multiplying in their favorite plants and crops. Nowadays, with a very dynamic world travel scene and extensive commercial activities, it is even easier for insects to move around globally and wreak havoc on crops. Now there is concern that these pests could extend their abilities (and appetite!) to crops grown in space for long term travel or habitation.

"As we look into a future when crops will be grown in space, we expect that beneficial nematodes will offer one of a kind opportunities to establish agriculture for longterm space exploration." said Dr. David Shapiro-Ilan, ARS Supervisory Research Entomologist at the Southeastern Fruit and Tree Nut Research Station in Byron, Georgia and co-project director.

Another startling finding was that nematodes born on Earth returned showing no problems, but those born and developed in space (under weightlessness conditions) had a hard time (or died) upon return to Earth. It is suspected that they became stressed upon re-entry to Earth due to the pressure of being exposed to "normal" gravity. This may be an important issue for long-duration space flights of nematodes to destinations such as Mars. Nematodes may need to be transported in a different developmental stage to ensure they survive on their destination planet.



October is National Pork Month. So give thanks the next time you bring home the bacon. It's our honor to provide coverage for those who feed the world. **Trust in Tomorrow.**[®]

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Friendly fungus protects against wheat scab

WASHINGTON — A fungal tenant of sorts that lives inside wheat plants could get its chance to "pay it forward" in the fight against fusarium head blight (a.k.a. scab), a costly disease of cereal crops worldwide.

Scientists with the Agricultural Research Service (ARS) in Peoria, are studying the fungal tenant for its potential to biologically control Fusarium graminearum, a harmful fungus that causes scab in not only wheat, but also barley, oats and other grain-producing crops.

Scab wreaks its costly havoc on two fronts: through

reductions in grain yield and quality, which can fetch a lower selling price, as well as the fungus's contamination of affected grains with vomitoxins, which can be harmful to humans and livestock. In fact, wheat with vomitoxin levels above one milligram is unacceptable for human consumption.

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Since varieties with complete resistance to scab have not been found, farmers use various approaches including partially scab-resistant varieties, fungicides, and other measures that can keep the disease at bay. However, each has drawbacks. For example, tillage methods used to disrupt the scab disease cycle can raise the risk of soil erosion.

To provide wheat growers with more eco-friendly options to choose from, a team with the ARS Mycotoxin Prevention and Applied Microbiology Research Unit in Peoria focused their attention on the tenant fungus Sarocladium zeae. The fungus is properly known as an "endophyte" because it spends part of its life cycle among the tissues and organs of wheat and certain other host plants in a symbiotic relationship with them. The endophyte isn't a danger to its host, but it can be to rival microbes like the scab fungus, which resides in many of the same parts of the wheat plant, including its grain-bearing structures.

In fact, when applied to the soils, stem or seed of wheat plants in growth chamber studies, the endophyte went from benign tenant to aggressive bodyguard when the scab fungus was introduced. One particularly robust strain, S. zeae NRRL 34560, curbed the spread and disease severity of scab by nearly 58 percent, and reduced production of vomitoxin in grain by 61 percent.

In addition to getting a head start on colonizing the wheat plant, the endophyte may also be secreting powerful antifungal compounds as well as helping prime the plant's own defenses against scab. The team reports these and other details in the October 2020 issue of Biological Control.

For future research, the team will continue evaluating the potential of endophyte seed treatments in both greenhouse trials and field tests using a variety of susceptible and resistant wheat varieties. Nathan Kemp, an Oak Ridge Institute for Science and Education (ORISE) research participant, led the study together with Martha Vaughan, Susan McCormick, Jacob Brown and Matthew Bakker—all with ARS.

The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency. Daily, ARS focuses on solutions to agricultural problems affecting America. Each dollar invested in agricultural research results in \$20 of economic impact.

New research database driven by growing hemp industry

URBANA – Industrial hemp is a new addition to Midwestern agriculture, and producers are learning while they develop practices in real time.

To help, University of Illinois Extension commercial educators are working with growers to provide cutting-edge research through the new Midwestern Hemp Database, available at go.illinois.edu/HempDatabase. "The database is an interactive platform, updated weekly, that helps guide growers," says Phillip Alberti, an Illinois Extension commercial agriculture educator. "Together, we're working to understand the performance of more than 440 industrial hemp varieties used in the Midwest and production practices."

In the mutually beneficial project, hemp producers submit information about what they are growing directly from the field. University staff analyze and share with the public. In exchange for their involvement, growers receive discounted cannabinoid testing on samples.

"As this is a new crop, we simply do not know what is and is not working in the Midwest," Alberti says. "This project allows us to learn a lot in a short period of time while allowing growers to conduct their own analysis."

One of the many roles of Illinois Extension educators is to understand agricultural needs, at both the local and state level, and in response provide research-based outreach and education. Through a survey, Extension staff found hemp producer's top concerns were a lack of information on cannabinoid levels throughout the growing season and at harvest, which is addressed in the database.

"This project puts data from around the Midwest into an easily accessible and interactive format," Alberti says. "Growers can feel confident using this database to make informed decisions about their operation."

The database is a collaborative project between four Midwestern land grant universities: Michigan State, University of Illinois, University of Wisconsin-Madison, and Purdue University.



The information provided by the database is open to the public and will be useful for not only processors, but also regulators. The impending adoption of USDA rules has made 2020 a valuable year to gather information that will be used in the final hemp bill, Alberti says.

"The response has been overwhelmingly positive, and we have received great comments and suggestions on improvements," Alberti says. "We intend to build upon the work here and expand both the scope in the next year."

Researchers hope to expand the project to include more state land grant institutions to develop a more comprehensive, regional resource.

Other production topics will also be explored including terpene production and heavy metal and biological contamination.

The application period for producers to participate in submitting information is closed.

Applications for 2021 will be available at go.illinois.edu/HempDatabase.



How ponds can save a home: Dry hydrants and rural fire protection

URBANA – Duane Friend grew up on a farm and knows the devastation rural fires can have on structures. Lack of nearby water supplies increased the danger of total structure losses. House or barn fires often require 10,000 to 25,000 gallons of water for full suppression and often require several trips from pumper trucks.

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"Having an accessible source of water in rural areas may be as close as a pond," Friend says.

Friend, a University of Illinois Extension energy and environment educator in western Illinois, says a pond can be turned into a water source through the use of a dry hydrant. Non-pressurized pipes are installed next to a body of water to supply the water needed for fire suppression.

"Having this type of water source can be a benefit to everyone living in the area and may help lower insurance premiums."

Before installing a dry hydrant, calculate how much water is available for pumping. To make this calculation for a pond, determine the surface square footage and multiply this amount by the average depth. To determine square footage for a rectangular pond, take the length times the width. For circular ponds, multiply 3.14 by the radius.

To figure an average depth, it may be necessary to take several depth readings across the pond.

"When the square footage and average depth are multiplied, this gives you the amount of water in cubic feet," Friend says. "Then, multiply that number by 7.5 to determine the gallons of water available. The amount of water available for pumping will be a little less than this amount since not all of the water can be pumped out."

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In the winter, ice will decrease the amount of available water, as well.

Friend specifies these installation considerations:

The hydrant should be well marked and located near an all-weather road to allow pumper trucks to hook up to it.

The hose connection must be 2 feet above the ground.

The intake needs to be 2 feet above the bottom of the pond and 2 feet below the anticipated low water level.

There is a limit to the height water can be pumped; the total vertical height of pipe from intake to outlet cannot exceed 18 feet, with shorter heights preferred.

Long, horizontal lengths must also be considered. For example, a 500 gallon per minute pump will only lift water 13 feet if the horizontal length of pipe is 200 feet.Most dry hydrants are made from 6-inch or larger

schedule 40 PVC pipe, Friend says. Additional components include a hose connection compatible with local fire trucks, two 90-degree or 45-degree elbows, and a strainer cap. Costs for installation can vary

from about \$700 to \$1,500, depending on your location and amount of materials needed, Friend says.

Once installed, dry hydrants must be properly maintained. Clear brush and trees for easy access. In addition, silt or plants should be kept from clogging the intake screen. "Regular inspections and back-flushing can be used as a training opportunity for new fire protection personnel," Friend suggests. For technical assistance on site suitability, survey, design and installation, contact your local Natural Resources Conservation Service or local Soil and Water Conservation District office.





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USDA forecasts US corn and soybean production up from 2019

WASHINGTON – Corn and soybean production is up from 2019, according to the Crop Production report issued today by USDA's National Agricultural Statistics Service (NASS). Soybean production is up 21% from last year, forecast at 4.31 billion bushels; corn growers are expected to increase their production 9% from 2019, forecast at 14.9 billion bushels.

In response to the derecho experienced by Iowa producers on August 10, NASS collected harvested acreage information for both corn and soybeans in Iowa. This data was analyzed along with remote sensing and administrative data in preparation for this report. As a result, NASS lowered corn harvested acreage in Iowa by 550,000 acres. Soybean acres were unchanged.

The average U.S. corn yield is forecast at a record high 178.5 bushels per acre, down 3.3 bushels from last month's forecast but up 11.1 bushels from last year. NASS forecasts record-high yields in Georgia, Kentucky, Michigan, Minnesota, New York, South Carolina, South Dakota, Washington, and Wisconsin. Acres planted to corn, at 92.0 million, are up 3% from 2019. Area to be harvested for grain is forecast at 83.5 million acres, down less than 1% from last month but 3% more than was harvested last year. As of August 30, 62% of this year's corn crop was reported in good or excellent condition, 4 percentage points above the same time last year.

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Area for soybean harvest is forecast at 83.0 million acres with planted area for the nation estimated at 83.8 million acres, up 10% from last year. Soybean yields are expected to average a record high 51.9 bushels per acre, down 1.4 bushels from last month's forecast but up 4.5 bushels from 2019. If realized, the forecasted

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yields in Indiana, Kentucky, Minnesota, Missouri, Ohio, Pennsylvania, and Tennessee will also be record high.

Today's report also included a production forecast for U.S. cotton. NASS forecasts all cotton production at 17.1 million 480-pound bales, down 6% from the August 1 forecast and down 14% from last year. Yield is expected to average a record high 910 pounds per harvested acre, up 87 pounds from 2019. As is done every year in September, planted and harvested acreage estimates for cotton were reviewed based on all available data, including the latest certified acreage data from the Farm

Service Agency (FSA). As a result, area planted to all cotton is estimated at 12.1 million acres, down less than 1% from the previous estimate and 12% below last year. Area to be harvested is forecast at 9.01 million acres, 3% below last month's forecast and 22% fewer acres than were harvested

last season.

NASS interviewed more than 9,100 producers across the country and conducted objective yield surveys for corn, cotton, and soybeans in preparation for this report. The Crop Production report is published monthly and is available online at www. nass.usda.gov/Publications.

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USDA Dairy Safety-Net Program signup to begin October 12

WASHINGTON, D.C. – The U.S. Department of Agriculture's Farm Service Agency (FSA) announces that Dairy Margin Coverage (DMC) safety-net signup for 2021 coverage will begin Oct. 12 and will run through Dec. 11, 2020. DMC has already triggered payments for two months for producers who signed up for 2020 coverage.

"If we've learned anything in the past six months, it's to expect the unexpected," said FSA Administrator Richard Fordyce. "Nobody would have imagined the significant impact that current, unforeseen circumstances have had on an already fragile dairy market. It's during unprecedented times like these that the importance of offering agricultural producers support through the delivery of Farm Bill safety-net programs such as DMC becomes indisputably apparent."

Authorized by the 2018 Farm Bill, DMC is a voluntary risk management program that offers protection to dairy producers when the difference between the all-milk price and the average feed price (the margin) falls below a certain dollar amount selected by the producer. Over 13,000 operations enrolled in the program for the 2020 calendar year.

All USDA Service Centers are open for business, including some that are open to

USDA study reveals airborne fungus can trigger plant growth

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in person by appointment only. All Service Center visitors wishing to conduct business with the Farm Service Agency, Natural Resources Conservation Service, or any other Service Center agency should call ahead and schedule an appointment. Service Centers that are open for appointments will pre-screen visitors based on health concerns or recent travel and visitors must adhere to social distancing guidelines. Visitors may

also be required to wear a

visitors to conduct business

face covering during their appointment. Field work will continue with appropriate social distancing. Our program delivery staff will be in the office, and they will be working with our producers in office, by phone, and using online tools. More information can be found at farmers. gov/coronavirus.

For more information, visit farmers.gov DMC webpage or contact your local USDA service center. To locate your local FSA office, visit farmers.gov/ service-center-locator.

WASHINGTON – The U.S. Department of Agriculture's (USDA) Agricultural Research Service (ARS) announced that a harmless airborne fungus, Cladosporium sphaerospermum strain TC09 (TC09), can dramatically accelerate plant growth if a germinating plant is near the fungus as it emits volatiles or gases.

Scientists used tobacco and pepper plants as models to study the conditions for accelerated plant growth once exposed to TC09. Following a relatively short duration of exposure at the seedling stage, the plants began to sense the fungi's volatiles and gases. USDA scientists were then able to stimulate extremely rapid plant growth, earlier flowering and fruit yield increases.

"This is a game-changer for agriculture and for research that seeks innovative ways to accelerate plant growth," said USDA Scientist Dr. Chris Dardick. "Its implications are far-reaching and will help ARS' commitment to deliver cutting-edge scientific advances for American farmers and producers."

The effects of TC09 were largely correlated with the



duration of exposure. Visual observation indicated that plants with TC09 exposure for 10 days exhibited substantially more vigorous growth, thicker stems, larger leaves, and a more robust root system relative to plants without fungal exposure. Results also showed that treated plants flowered 20 days sooner and pepper plants vielded up to 213 percent more fruit that was ready for harvest three weeks earlier than untreated controls. More recent studies have shown similar research results for numerous other crops such as lettuce, arugula, kale, basil, and other

leafy greens.

This species of fungus is commonly found in indoor environments and is not known to cause disease in plants or any ailments in humans or animals. Also, unlike other microbial species that have been tested, the researchers showed that TC09 does not induce defense or stress responses in exposed plants. Scientists hope to identify the specific volatiles and gases that stimulate plant growth in future research.

Research on microbial biostimulants that enhance plant growth has recently intensified because they provide an eco-friendly,

cost-effective and sustainable strategy to benefit agriculture. USDA scientists will continue to study TC09 and seek practical strategies to apply it during commercial crop production, particularly for urban and indoor agricultural systems. They are awaiting approval of a patent and commercial evaluation license and partnered with NASA to apply this research technology to spaceflight conditions. This research was supported in part by grants from USDA-ARS, ARS' Appalachian Fruit Research Lab, and the Oak Ridge Institute for Science and Education.

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