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Spring Manure Application Reminders

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Why manure application should be on your Spring To-Do List.

Spring can be a busy time, the window for field work can be short, and spring rainfall can keep soils wet, leading to concerns of compaction. There can be some clear economic and environmental advantages to applying manure in the spring, however. As input costs rise, producers using manure for crop production should consider how they can integrate more spring application into their production systems.

Also, with much of the state rated as either abnormally dry or in moderate drought conditions as of March 10, conditions might be more favorable for spring manure application this year.

Why apply manure in the spring?

Aligning nutrient availability with crop nutrient demands is good for the farm bottom line as well as downstream water quality. Research has shown us that applying nitrogen closer to when the crop needs it can reduce the risk of nitrogen loss to the environment. Fall applications of nitrogen can pose a risk for nitrogen loss to the environment, especially when manure is applied earlier in the fall. With a longer period of time between manure application and crop nitrogen use, there is

higher likelihood that some nitrogen conversion and leaching will occur.

Especially with high nitrogen fertilizer prices, it can pay to apply manure in the spring. Across multiple research studies in Iowa and Minnesota, significant corn yield benefits (average of 33 bushels per acre) have been found by delaying manure application from late fall when soils are 50°F and cooling until spring. With 2022 futures corn prices, yield improvement can easily total to over \$200 an acre in value.

Cost savings can also add up fast with today's fertilizer prices. The value of nitrogen in manure can often account for half of the manure's total fertilizer value. In typical swine finishing manure with 50 pounds N per one thousand gallons and applied at a rate of 4,500 gallons per acre, the nitrogen value alone can sum up to over \$200 per acre. How much of that \$200 is actually available to the crop and how much leaches out will depend on manure application practices and weather. Factors at play include: 1) how close to crop nitrogen use the manure is applied, 2) how warm of soil temperatures the manure is exposed to as it sits in the soil, and 3) how much excess moisture goes through the soil. Applying in the spring will ensure you're getting most of that \$200 value and won't need to spend money on other sources of nitrogen fertilizer this spring.

Producers are looking to make sound economic decisions as input prices soar. Consistently applying a portion of our manure in the spring can be a viable economic decision. Weather and timing constraints will likely keep

producers from applying all of their manure in the spring but shifting as much as is feasible to the spring can mean big savings in fertilizer costs and gains in crop yield. Additionally, consistent spring manure application can give us some added flexibility within our manure storage systems.

Best practices for spring application:

- Prioritize fields with well drained soils, adequate drainage, good soil structure, and possibly those with less snow cover this winter.
- Consider reducing manure load sizes to limit axle loads to less than 10 tons, which will help reduce the risk of deep compaction.
- Check for proper tire inflation. Consider reducing tire pressure to less than 20-35 psi and using flotation tires to reduce the risk of surface compaction.
- Limit field traffic by designating sacrifice paths.
- Agitate manure well for a more uniform nutrient application and sample manure for nutrient content to know what you are applying.
- Check and calibrate application equipment for application rate uniformity and good injection or soil incorporation.
- Watch weather forecast closely and avoid manure application before rainfall events.

Additional Resources:

[Early Fall Applied Manure Can Lead to Corn Yield Loss | Integrated Crop Management \(iastate.edu\)](#)

[Calibrating Liquid Tank Manure Applicators | Iowa State University Extension and Outreach](#)

[Soil compaction | UMN Extension](#)

[Soil Compaction Threat is High This Spring \(psu.edu\)](#)

Higher Fertilizer Prices, Manure Opportunities

Fertilizer prices remain high this spring, but it can offer an opportunity for those with manure resources. What are some of the options you have to get more from your manure and how can you take advantage of it this spring. Read more at [The Manure Scoop](#).

Catchment-scale export of antibiotic resistance genes and bacteria from an agricultural watershed in central Iowa.

Timothy Neher, Graduate Research Assistant, Ag. And Biosystems Engineering, Iowa State University



Figure 1. Monitoring station in the Black Hawk Lake watershed.

While the livestock industry produces high-quality beef and pork products, it also generates manure. The accumulating manure is usually applied to row crops to fertilize the soil and sustainably manage the manure. The

unfortunate consequence of manure application is the release of unwanted substances like undigested antibiotics. Antibiotics are a critical part of animal production that keeps animals healthy and increases their quality of life. Frustratingly, the use of antibiotics is a double-edged sword, where elevated concentrations of antibiotics can cause surrounding bacteria to develop immunity, known as antibiotic resistance. A global effort is being made to reduce the chances of antibiotic resistance from spreading. In animal production, efforts toward this goal include targeted antibiotic treatment, limited use as growth promoters, and evaluation of alternative manure utilization projects. This study aims to understand if manure application raises the levels of antibiotic resistance in downstream surface water.

The monitoring study developed by a research team in the Water Quality Research Lab at Iowa State University took place over two years from 2017-2018 in western Iowa's Black Hawk Lake. A watershed is the area of land that drains water into a downstream area. There were ten swine confinements and six cattle lots within the watershed, and 74.6% of the land was in row crop production.

The study was designed to compare antibiotic resistance in downstream water from areas with manure application against areas without manure application. The researchers obtained water samples every two weeks and measured indicators of antibiotic resistance. The indicators measured in the water samples were bacteria species known to originate from the inside of warm-blooded animals. These indicator bacteria were grown in the lab in the presence of two different antibiotics. Any

bacteria that grew was identified as resistant to the antibiotic. The researchers counted the resistant bacteria from each location and tested differences between areas with manure application and those without manure application.

The comparison of two smaller areas (600 acres) showed that the bacteria resistant to the antibiotics were higher in the manure applied area than in the area without manure application in 2017. However, there were no differences between the two in 2018. Additionally, the study measured the antibiotic-resistant bacteria from two slightly bigger areas (2000 acres) within the Black Hawk Lake Watershed. One area had manure application, and an upstream urban area influenced the other. The researchers found similar results where the antibiotic-resistant bacteria from the animal-manured area was higher than the urban-influenced area in both years of monitoring.

This study implies that areas with manure application increased antibiotic resistance in downstream surface water. These findings are important when considering the impact of manure application on antibiotic resistance in surface water. Many of the streams and rivers downstream of animal production eventually lead to recreational areas like lakes and public beaches with a greater chance of human exposure. Understanding the role of livestock production on the spread of antibiotic resistance will help keep antibiotics effective in human and animal medicine for generations to come.

You can find out more about this study [here](#).

Highly Pathogenic Avian Influenza Resources

Highly pathogenic avian influenza (HPAI) has been confirmed in Iowa. Poultry producers are encouraged to review biosecurity practices at their farm. The Center for Food Security and Public Health has a [biosecurity checklist](#) and a [visual guide about bird protection](#). The [HPAI Toolkit](#) from the Iowa Poultry Association contains resources about prevention and detection of the disease in your flock. Additional resources can also be found at the [APHIS website](#) and [IDALS](#).

Events

[Urban Livestock Webinar](#)

March 18, 2022, 1:30 pm

[Advanced RUSLE2 Workshop](#)

March 29, 2022, Altoona