

Manure Management: Economics, Agronomics, Environment

Note: This is part two of a two-part series. Part one looked at manure management from a consultant perspective. Part two focuses on the perspectives of a cattleman and a row crops farmer.

Animal agriculture continues to expand in Nebraska and plays a vital role in supporting Nebraska's number one industry. Cattle, hogs and poultry consume millions of tons of grains produced in the state annually.

With the growing livestock sector comes a need for the management of nutrients that are produced in manure. For decades, Nebraska farmers have used manure as a nutrient and soil builder to improve their production of crops.

However, that usage is on the uptick thanks to improvements in research, equipment and availability of companies offering manure management services.

The Supplier

Longtime cattleman Mike Drinnin's first job on his dad's farm was tamping posts when he came home from grade school.

"We had our first fence line bunks in the 70s, and I have been part of the operation ever since," said Drinnin who helps oversee feedlots at two locations.

The original farmstead sits on the edge of **Columbus** and is permitted for 3,500 head of cattle. A second feedlot is located near **Palmer** and is permitted for 10,000 head. Sons Sam and Jarad manage the day-to-day operations at the two sites, and Mike is what he describes himself as the "cheap labor."





Drinnin with a handful of distillers grain, an important step in adding value to manure.

Drinnin estimates that those two feedlots generate from 7,000 to 10,000 tons of solid manure each year.

"We've always known there was value to the manure," said Drinnin. "The challenge was, how do we get it out to farms that are farther away."

With improved equipment and working with a manure management company, Drinnin said they are now able to transport the product up to a maximum of 20 miles. But the key to having a good product to sell is managing the manure properly.



Holt has seen poor farmground improve significantly when he added manure into his nutrient management plan.

"It's all about battling moisture, so we consistently scrape our pens as much as we possibly can," said Drinnin. "You try to handle that manure dry as much as you can. If you don't and get a big weather event, that two inches of manure can swell up to six inches."

It's also important to keep the manure free from dirt and other materials as much as possible to assure a good quality product. Once removed from the pens, the manure can be piled up and stored for long periods of time. Cleaning the pens regularly also reduces odor and the fly population, which neighbors greatly appreciate.

Drinnin added that the introduction of ethanol plants in Nebraska has also been an important factor improving the quality of cattle manure. When corn is manufactured into ethanol, it produces a by-product called **distillers grains**. That by-product is one of the

primary feed sources for many of the cattle operations across the state.

"In all the years, probably the biggest change in manure value we've seen is when we started feeding distillers grains," said Drinnin. "As a result we've gotten more phosphorous in the manure, and that's what buyers are looking for."

Phosphorous and organic matter are important components to building soils that otherwise would be marginal to produce good crop yields.

While Drinnin and other cattle producers work diligently to assure customers get a quality product, it's more about manure utilization than making money.

"You'll never sell enough manure to call it a profit center," said Drinnin. "It's just about reducing your operating costs. Selling the manure helps offset some of the costs you have day to day."

Drinnin added that the real value in manure is when you can spread it on your own fields. However, with limited cropland himself, he estimates that he sells 75 to 85 percent of the manure produced at his two feedlots.

The End User

Matt Holt is relatively new to the manure management game. The corn/soybean farmer from the Holdrege area has known about the value of using manure as a soil builder for many years. It wasn't until he began renting land with sandy soils near **Minden** that he started getting serious about it.

"Ten years ago we began renting six quarters of land in the sand just north of a feedlot," said Holt. "At that time, the manure costs were high enough where we were renting on a one-year lease, that it just wasn't cost feasible."

However, over the next seven years Holt did as he describes, "got the farms back into shape" and became more comfortable with the arrangement he had with his landlord. He felt the timing was right to take the next step. It started three years ago with a discussion with a consultant at a nutrient management company.

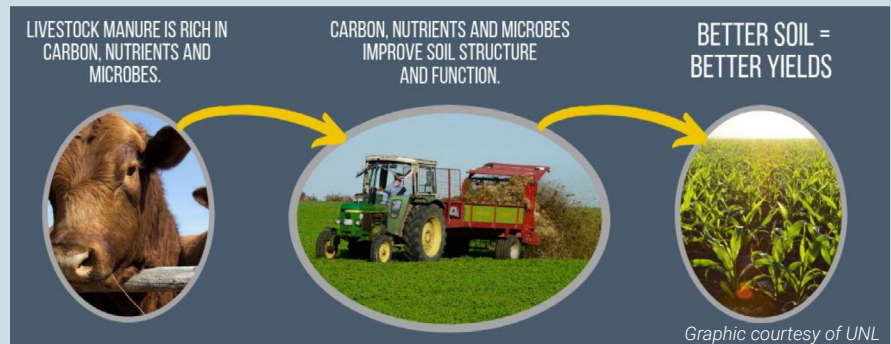
"He reached out to me about the possibility of applying manure, and he gave me a quote on those farms, so I decided to do two of the fields with pivots the first year," said Holt. "The cost of commercial fertilizer had gone up, so the value was really there."

Holt also had the advantage of having the land adjacent to the feedlot facility, eliminating much of the transportation costs. The biggest advantage of using manure was the organic matter, potassium and phosphorous it provided to build up the sandy soil.

The University Team

The University of Nebraska offers numerous resources and experts regarding **Animal Manure Management (AMM)**. Several Extension educators and specialists have formed an **AMM Project Team** that provides several services including land application training for livestock facility managers, owners and employees who are required to have manure education.

Project Coordinator Leslie Johnson said that the University began offering training and other services for manure management almost 20 years ago.



"The initial mission of the team was to protect water quality through better manure management," said Johnson. "While that mission has not changed, it certainly has expanded."

Team efforts include offering opportunities for producers to learn more about the agronomic, economic and

environmental benefits of manure management. The team publishes articles along with other resource materials and tools on the AMM website.

Johnson added that the team is also working with other states' manure management teams as a way to share information and practices across state lines.



“There are just a lot of benefits from an agronomics standpoint,” said Holt. “It’s a different form of fertilizer, with a slower release and is less apt to flush.”

Grid sampling the soil, how the manure is applied, and the quality of the product, are all key factors in the success of using manure as a nutrient and soil builder. After applying manure to two quarters the first year, Holt decided to go on a three-year rotation and completed first-year applications to all six quarters at the end of the 2019 crop year.

“Our yields have gone up, there is no doubt,” Holt explained. “How much of that is the result of the manure? I can’t say for sure.”

Weather variables, crop rotation and varieties all factor into the equation, but Holt said the eye

test alone told him the plants were more vibrant. He gave one example of evidence the soil was in better shape than before he started applying manure.

“In one of the fields, the top of the hills were pure sand,” said Holt. “We could get a stand if we watered those areas really hard but then we would flood out the good plants at the bottom of the hill.

“No-till helped the situation and so did adding cover crops. Once we added the manure, we noticed the plant height from the top of the hills to the bottom didn’t vary more than 15 percent, whereas before, it varied almost 50 percent.”

The manure is typically applied in the fall or early winter followed many times by a commercial

application of nitrogen in the spring. The bottom line for Holt is that over time he has been able to build up the soils with manure to meet his yield goals.

Holt said due to the early success of his manure management plan, some of his neighbors have begun looking into adding the practice to their operations.

Utilizing manure has become an important part of Nebraska’s agriculture industry. It provides a path to an environmentally-sound practice that builds soil health by adding organic matter and nutrients. With improvements in application equipment, management skills and research, manure management also results in economic benefits for both the seller and user.

There are several companies in Nebraska that offer manure management services and also connect buyers with sellers. Learn about two of these companies in [part one](#) of this NDA Feature.