

# Manure Management: Economics, Agronomics, Environment

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*This is part one of a two-part series. It focuses on manure management from a consultant perspective. Part two will offer the perspective of a cattle producer and row crops farmer.*

If you could find a way to increase corn and soybean yields, be more cost efficient, and act in an environmentally-friendly manner, you would do it, right?

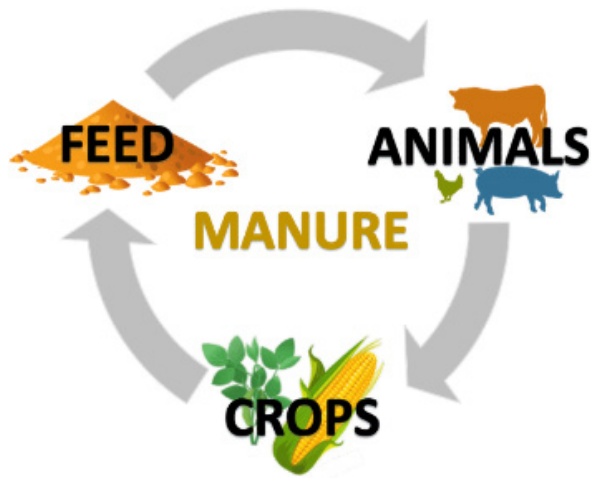
Using manure as an organic fertilizer is far from a new concept. In fact, according to research done at the University of Nebraska, while current fertilizer practices date back to just the last half of the 20th century, it is believed that early farmers were using manure to fertilize their crops as long as 8,000 years ago.

Thanks to current day nutrient management practices, animal manure continues to provide Nebraska farmers with a path to improve soil health and cut input costs over time, resulting in increased profitability. You could call it nature's recycling plan.

This continuous circle connects livestock and poultry to the grains that feed them. Cattle, hogs and chickens eat various forms of corn and soybeans, which, when processed through their digestive systems, leaves waste called manure. That manure is a valuable resource used to help build healthy soils and supply vital nutrients in the field where crops are planted.

Manure management practices, which include the capturing, storing, treatment and utilization of manure, made a strong comeback in the last 25 plus years due to escalating commercial fertilizer prices and an increase in nutrient management knowledge and expertise. In addition, the livestock and grain producers began to see the mutual benefits for each other in the buying and selling of manure.





Graphic courtesy of UNL

That's where nutrient management consultants like Settje Agri-Services and Engineering in Raymond and Nutrient Advisors in West Point found a role in assisting both sides to better understand the true value of manure.

"Our initial conversation with the row crop farmer is demonstrating what the value of that manure is relative to the cost of commercial fertilizer," Travis Caspersen with **Settje Agri-Services** said. "We analyze the manure and then come up with a price of what that manure is truly worth."

Caspersen said that it is important that the farmers he works with understand that the cost efficiency of applying manure is captured over a three to five-year time period.

"In that first application, you're usually going to get three to five years of needed phosphorous from that manure, reducing the need for commercial phosphorous," Caspersen said.

For best efficiency, the first step in the process is writing a solid nutrient management plan.

"It's a lot like putting a financial budget together," said Andy Scholting with **Nutrient Advisors**. "What we are really accounting for is what that farm needs. How many acres do they have? What crops do they plan to plant? What are their yield goals?"

Deciding what, when, where, how much and why when it comes to manure management, is a much more complex process than simply applying manure to a field.

There's grid sampling of the soil, lab testing, analyzing the nutrient content of different types of manure and setting yield goals. Then there is the challenge of logistics.

## Considering Costs

"Obviously the location to a livestock facility makes a big difference in cost efficiency and economics because of transport costs," said Settje Agri-Services' Caspersen. "When you are talking about a dry product like cattle manure or chicken litter, it is a lot easier to truck than a slurry, for example."

Slurry is a combination of manure and a lot of water, which is typically generated in hog barns or on dairy operations. Most slurries are applied to fields in close proximity to the livestock operations that produce it.

"Because of transportation costs, we usually are not going to transport slurry more than three to five miles," said Caspersen.

Travis Caspersen, Division Lead, Settje Agri-Services and Engineering



“Depending on the quality of the cattle manure, we might be able to haul it on average, 25 to 30 miles.”

Chicken litter is the driest form of manure and can be transported the furthest while remaining cost effective.

When it comes to cattle manure, which is the primary product Caspersen deals with, quality is the most important attribute to determine price.

“What we try to do with the facilities we work with is keep the product consistent,” said Caspersen. “If the manure comes from a basin, that goes in one pile. If it comes out of a pen, it is stockpiled separately. We also separate higher moisture manure from drier manure.”

The quality of the manure is important because it determines nutrient and organic matter value as well as setting a fair market price.

### Which Manure is Best?

Each animal manure type has its own attributes and deficiencies, according to Nutrient Advisors’ Scholting.



Image courtesy of Nutrient Advisors

Slurry (manure in liquid) being injected into the soil.

Scholting’s company received the contract from **Lincoln Premium Poultry** to write nutrient management plans for the chicken operations that are supplying broilers for **Costco**.

“It’s a pure product with few impurities since it is produced in a completely controlled environment,” said Scholting. “Poultry litter is very concentrated in nutrients, up to three times more per ton than some other manures.”

Those higher nutrients mean chicken litter is in high demand, especially in the organic market where commercial fertilizers are not used.

“Cattle manure has less nutrients than chicken litter, but contains more organic matter,” said Scholting. “Organic matter is more of a soil amendment and is highly coveted by farmers with eroded soils with shallow topsoil and low organic matter.”

Scholting pointed out that many fields in Nebraska are greatly lacking in nutrients. However, with improved quality of the end product and better equipment, farmers have been able to utilize manure better than they have in the past.

“Hog and dairy manure is generally going to be 95 to 98 percent water,” said Scholting. “It limits the distance you can transport it cost effectively, but it is still highly valued because it has a lot of nitrogen.”



Image courtesy of Nutrient Advisors

## Staying Compliant

Manure, no matter what form or type, is considered to be natural. How, how much, when and where manure is applied is crucial in order to prevent runoff which creates water quality issues.

“There are regulations we have to follow,” said Caspersen. “What we are doing with the manure is the best thing that has come around for a long time in regards to impact to the environment and neighbors.”

Much of the regulations are a result of the federal **Clean Water Act**, which is enforced by the Environmental Protection Agency.

“Each state has its own legislation of how they interpret and enforce the Clean Water Act,” said Scholting. “The **Nebraska Department of Environment and Energy** implements those regulations in our state.”



*Andy Scholting, co-founder,  
Nutrient Advisors*

For Settje Agri-Services and Nutrient Advisors, offering compliance services is an important part of their companies’ business. They work diligently with clients to keep records and conduct activities needed to make sure they are following regulations.

Both companies serve as a third party connecting supply with demand, thus providing a

valuable service to those who raise livestock and poultry and those who grow the crops to feed them. By carefully analyzing soil samples and manure content, consultants can best match the needs of each party by assuring each field gets the appropriate amount of nutrients and organic matter.

By developing manure management plans, crop producers can determine when and where they need to supplement fields with commercial fertilizers and apply at precise rates.

Manure utilization continues to be an important aspect of Nebraska agriculture with the expansion of the poultry and livestock industries in the state. It also provides farmers and ranchers another tool to assist their on-going efforts to improve production efficiency.

