



The Smell of Money: Economics of Poultry Litter

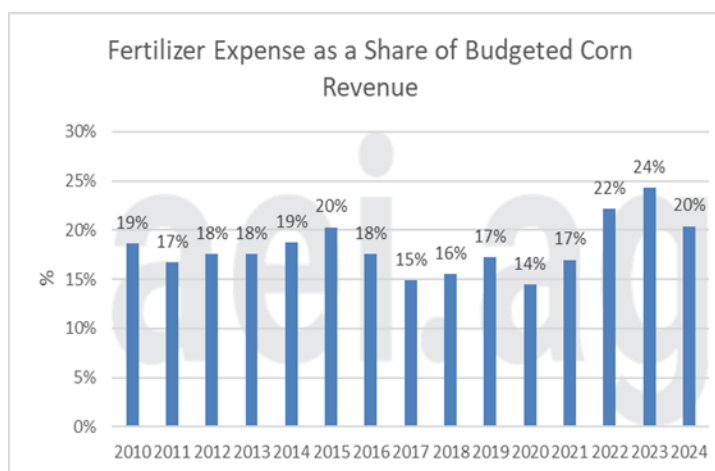
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Using poultry litter as a fertilizer source has been a long-established practice on the Eastern Shore and is readily available due to the amount of poultry house operations present. This fact sheet will discuss fertilizer expenses within a crop budget, the benefits of using poultry litter, estimating the real cost of poultry litter, and determining cost savings when using poultry litter as a fertilizer substitute or additive.

Fertilizer Expenses Within a Crop Production Budget

Fertilizer markets change from production year to production year for many different reasons. Price shocks in fertilizer prices impact producers more than any other input price increases due to a significant portion of variable expenses comprising of fertilizer expenses. In recent years, input prices peaked in 2022 and 2023. Below is a chart from Agricultural Economic Insights (AEI) that shows fertilizer expenses as a share of budgeted corn revenue from 2010 to 2024. Clearly, high fertilizer prices from 2022 and 2023 are evident in the graph.



It is important to remember that commodity prices often correspond with fertilizer prices as well. Corn prices follow a similar price pattern over the same time period as well.

To show how significantly fertilizer prices can vary, consider how significantly fertilizer expenses as a percentage of variable expenses has changed from 2022 to 2025. In 2022, fertilizer expenses accounted for the following:

Corn – 50% of all variable expenses

Wheat – 55% of all variable expenses

Soybean – 43% of all variable expenses

In 2025, fertilizer expenses are projected to account for the following:

Corn – 35% of all variable expenses

Wheat – 36% of all variable expenses

Soybean – 25% of all variable expenses

Considering the percentage of variable expenses fertilizer accounts for and annual fluctuations in prices, poultry litter is an attractive, affordable alternative or addition to using commercial fertilizer.

Poultry Litter as a Fertilizer Source

Poultry litter is an excellent source of nutrients when combined with soil best management practices such as soil testing. Application of poultry litter builds soil fertility and returns organic matter to the soil. In addition to nitrogen (N), phosphorus (P), and potassium (K), poultry litter contains calcium, magnesium, sulfur, and micronutrients. Producers using poultry litter must practice sound soil fertility management to prevent nutrient imbalances to avoid surface and groundwater contamination. It is imperative to follow all nutrient management plans when using poultry litter as an alternative fertilizer source.

Economic Value of Poultry Litter

Calculating the economic value of poultry litter varies with the nutrient composition of litter and current fertilizer prices. Determining the real economic value of poultry litter is considerably straight forward. It is difficult to quantify essential nutrients in poultry litter due to variation. Aspects of the bird's lifecycle can vary the nutrient composition of poultry litter (feed rations, litter type, etc.). When estimating the financial value of poultry litter, only assess the N, P, and K content.

Example of Estimating Real Value of Poultry Litter

To estimate the real value of litter to commercial fertilizer, convert total nutrient composition (N, P, and K) of litter to commercial fertilizer prices. Consider the following example:

A nutrient analysis of a poultry litter sample shows the N, P, and K content being:

- 57 pounds of nitrogen per ton
- 99 pounds of phosphate per ton
- 113 pounds of potash per ton

Commercial fertilizer prices for N, P, and K are as follows:

- \$0.60 per pound of nitrogen
- \$0.73 per pound of phosphate
- \$0.40 per pound of potash

In this scenario, the real value of one ton of poultry litter would be worth:

$$(57 \text{ lbs N} \times \$0.60 \text{ per lb}) + (99 \text{ lbs P} \times \$0.73 \text{ per lb}) + (113 \text{ lbs K} \times \$0.40 \text{ per lb}) = \$151.67 \text{ per ton}$$

Considering average prices paid for poultry litter on the Eastern Shore, the real value of the litter is typically far greater than the actual value.



Calculating Cost Savings of Using Poultry Litter

To estimate the cost savings of using litter instead of conventional fertilizer, first estimate the percentage of fertilizer expenses in the variable budget if conventional fertilizer was used.

For non irrigated corn, lets assume our estimated fertilizer needs are:

- 160 lbs of nitrogen
- 30 lbs of phopshate
- 60 lbs of potash

The total cost of this fertilizer using the prices from before would be:

$$(160 \text{ lbs N} \times \$0.60 \text{ per lb}) + (30 \text{ lbs P} \times \$0.73 \text{ per lb}) + (60 \text{ lbs K} \times \$0.40 \text{ per lb}) = \$141.90.$$

If the total estimated variable costs total out to \$400 per acre, our fertilizer expenses using conventional fertilizer products would be 35% of our variable expenses (\$141.90 / \$400). Lets now assume 2.5 tons of litter will be used at \$30.00 per ton instead of conventional fertilizer with the same non-irrigated corn example. We take our total variable expenses and subtract our conventional fertilizer from the budget:

$$\begin{aligned} \$400 \text{ variable expenses} - \$141.90 \text{ fertilizer expenses} = \\ \$258.10 \text{ which is our variable expenses without} \\ \text{fertilizer expenses.} \end{aligned}$$

Substitute the poultry litter for the conventional fertilizer.

$$(2.5 \text{ tons of litter} \times \$30.00 \text{ per ton}) + \$258.10 = \$333.10 \text{ total variable expenses}$$

In this scenario, the cost savings of using poultry litter instead of conventional fertilizer was \$66.90 (\$400 - \$333.10). Poultry litter accounted for 22% of the total variable cost budget when substituted (\$75 total for the poultry litter / \$333.10 total variable expenses) while the same example with conventional fertilizers accounted for 35% of the total variable cost budget (\$141.90 total for conventional fertilizer / \$400 total variable expenses). Using poultry litter in this scenario as a substitute was a 13% cheaper option than using conventional fertilizer (35% - 22%). In years where fertilizer expenses are significantly higher, this cost benefit of using poultry litter can be significantly higher, sometimes being cheaper by 25% - 30%.

Summary

This method of calculating the real value of poultry litter and evaluating cost savings does not include labor, hauling, handling, or application costs. These need to be also determined when conducting a cost benefit analysis of using litter. Regardless, the real value of poultry litter is far greater than the common average price paid per ton on the Eastern Shore. In addition, to a lower price, long-term usage of poultry litter has shown improvements in soil health. Oftentimes though these long-term benefits are difficult to quantify in numerical values.

<https://www.udel.edu/academics/colleges/canr/cooperative-extension/fact-sheets/maximizing-potential-of-poultry-litter-for-crop-production/>

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