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Comparing Fertilizer Prices by Unit of Nutrient

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High prices and countless options can make fertilizer decisions overwhelming. When developing farm budgets, fertilizer price is an important consideration to ensure you are using the most cost-effective fertilizer source that meets your needs.

This fact sheet provides insight into how to compare fertilizer products based on the cost of nutrients applied. It is intended to build on the knowledge gained in "*Understanding Fertilizers Nutrient Content and Guaranteed Analysis*" (FSA2222) and "*Understanding Fertilizer Calculations*" (FSA2223), although the information presented can be used without referencing them.

Information such as soil analysis, available products and cost are necessary to make fertilizer recommendations. This article is focused on using available information to ensure you receive the most effective and efficient product.

Calculating the Price of Nutrients in a Fertilizer

When comparing fertilizers to identify the most cost-effective option, it is important that the products are compared uniformly by the price of the nutrient applied. While there are other considerations for determining the proper fertilizer needed to meet recommendations, similar fertilizers often have a different tonnage price that could be a deciding factor.

To accurately determine the price of a nutrient in a fertilizer, it is important to identify the nutrient the price would account for. For instance, urea and ammonium nitrate only contain N, therefore the price would be per pound of N. Alternatively, multi-nutrient fertilizers are often based on the nutrient in the highest concentration, such as P_2O_5 in Di-ammonium Phosphate (18-46-0). Balanced fertilizers, such as Triple 20, would have the same per nutrient price regardless of the nutrient chosen.

While fertilizer prices are usually in dollars per ton, the price can be converted to a per-pound of nutrient using the nutrient concentration of the fertilizer. The first step is to determine the amount of nutrients per the priced unit. Below are two examples of a granular (urea) and a fluid (UAN 32 percent) fertilizer.

The following example compares urea at $500 per ton, to UAN 32 percent at $350 per ton.

Granular Fertilizer

2,000 (lb per ton of Urea) × 46 (% N in Urea) ÷100=920 (lb N per ton of Urea)

Fluid Fertilizer

2,000 (lb per ton)× 32 (% N in UAN) ÷100=640 (lb N per ton of UAN)

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After determining the amount of nutrients in the product unit, the price can be divided by the amount of nutrients per unit.

Granular Fertilizer

500 ($ per ton of Urea) ÷ 920 (lb N per ton of Urea) =0.54 ($ per lb of N in Urea)

Fluid Fertilizer

350 ($ per ton of UAN) ÷ 640 (lb N per ton of UAN) =0.55 ($ per lb of N in UAN)

While looking at the price per ton in this example, the UAN 32 percent price was $150 per ton less than urea. However, when compared by the price of the nutrient, the cost of the fertilizer is very similar. This example shows that knowing the nutrient content of a fertilizer is important for selecting an economical fertilizer.

Price Credits of Multi-Nutrient Fertilizers

It is important to remember that there are other conditions that may need to be considered to identify the right fertilizer source. Multi-nutrient fertilizers, for example, have the added benefit of reducing the amount of supplemental fertilizer that may be needed, and that may add value to the product. Accounting for this value may be important when making fertilizer decisions, but to provide the credit, the product application rate must be first calculated (see FSA2223 on how to calculate application rates). Below is an example of how to calculate and include a credit of a multi-nutrient fertilizer.

In this example, Triple 20 (20-20-20) is used to supply 40 lbs. of P_2O_5 per acre (200 lbs. T20 per acre) for $500 per ton. The nitrogen price of urea ($0.54 per lb. N), previously calculated, and Potash (0-0-60) price of $0.42 per lb. K_2O ($500 per ton) will be used as the credit value.

Calculating N credit

200 (Product Rate) × 20 (% of Added Nutrient)× 0.54 (Nutrient credit)÷100 =21.60 ($ price credit)

Calculating K_2O credit

200 (Product Rate) × 20 (% of Added Nutrient)× 0.42 (Nutrient credit)÷100 =16.80 ($ price credit)

The nutrient price credit(s), which may be more than one, can be subtracted from the per-ton price of the fertilizer to reduce the cost.

500 ($ per ton of Urea)-21.60 ($ N credit) - 16.80 ($ K_2O credit) =461.60 (Adjusted Price per Ton)

Then the price per original nutrient can be calculated, accounting for the additional nutrients that are supplied.

461.60 ($ per ton of T20) ÷ 400 (lb P_2O_5 per ton of T20) =1.15 ($ per lb of P_2O_5 in T20)

Without the credits for the additional nutrients, Triple 20 would cost $1.25 per pound of P_2O_5. When accounting for the additional nutrients applied, using the nutrient price of the supplemental fertilizers Triple 20 price was reduced to $1.15 per pound of P_2O_5. While this reduction is minimal, it may be worth considering when comparing fertilizers.

It is however, important to avoid over-fertilization when using multi-nutrient fertilizers. The potential of over-fertilization is a factor that may influence the fertilizer decision. It is important to take all potential factors into account when making decisions on fertilizers, including soil test recommendations, application methods, timing and price, just to name a few.

Summary

Fertilizer prices can be overwhelming when planning and building production budgets. Using the information outlined in this fact sheet, fertilizer prices can be compared on a uniform scale to determine the most economical option. The following page provides a step-by-step, fill-in-the-blank guide for calculating fertilizer price per nutrient. The information presented here is not to deter or enforce the use of any one fertilizer type or source, but solely to help producers better understand what is being used. This information should be used in conjunction with soil tests, nutrient removal and other recommendations for guiding fertilization programs and maintaining proper nutrient stewardship. For more information on fertilizer calculations, soil testing or nutrient recommendations, please contact your local University of Arkansas Division of Agriculture Cooperative Extension Service or visit https://www.uaex.uada.edu/.

Fertilizer Calculations Work Sheet

This is a work-through sheet to help you compare the value of fertilizers on a per-pound-of-nutrient basis. This can be used for granular or fluid fertilizer products. Using a pencil for mistake correction is recommended.

Fertilizer 1 Name: _____

_____% _____% _____% _____% _____% _____ $_____/Ton
N P_2O_5 K_2O SO_4 Zn B F1 Price

Fertilizer 2 Name: _____

_____% _____% _____% _____% _____% _____ $_____/Ton
N P_2O_5 K_2O SO_4 Zn B F2 Price

Step 1. Calculate the amount of nutrient of interest per ton of product.

Determine the amount of the nutrient of interest available in a ton of each fertilizer product.

Fertilizer 1

(2000) ÷ _____ ÷ 100 = _____ **lb** of _____ per Ton of _____
(lb per ton) (% nutrient) (Answer F1) (Nutrient) (Fertilizer 1 Name)

Fertilizer 2

(2000) ÷ _____ ÷ 100 = _____ **lb** of _____ per Ton of _____
(lb per ton) (% nutrient) (Answer F2) (Nutrient) (Fertilizer 2 Name)

Step 2. Calculate the cost of the nutrient of interest for each fertilizer.

Convert the price per ton to the price of the nutrient to compare fertilizer prices uniformly.

Fertilizer 1

_____ ÷ _____ = $_____ per **lb/ac** of _____ in _____
(F1 Price) (Answer F1) (Answer P1) (Nutrient) (Fertilizer 1 Name)

Fertilizer 2

_____ ÷ _____ = $_____ per **lb/ac** of _____ in _____
(F2 Price) (Answer F2) (Answer P2) (Nutrient) (Fertilizer 2 Name)

Step 3. Compare the fertilizer nutrient prices.

Compare the nutrient price of the two fertilizers to ensure the most cost-effective method is used.

Fertilizer 1

_____ $ _____ per **lb/ac** of _____

(Fertilizer 1 Name) (Answer P1) (Nutrient)

Fertilizer 2

_____ $ _____ per **lb/ac** of _____

(Fertilizer 2 Name) (Answer P2) (Nutrient)

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