Forage News

MISSISSIPPI STATE UNIVERSITY EXTENSION
Center for Forage Management and Environmental Stewardship

Fertilizer Prices: How to Get Most of Your Application?

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Fertilizers prices are affected by multiple market factors beyond the control of livestock producers. These prices (especially nitrogen) and increasing concerns regarding availability are the main concerns among livestock producers as we start 2022. Nitrogen is an essential commodity for annual ryegrass production this time of the year and as we prepare for the hay season in the spring. Fertilizer prices have been exacerbated to higher rates compared to the 2008 crisis due to COVID-19 which has created low fertilizer inventories and the inability of the fertilizer industry to adjust production levels coped with strong domestic and global demand (Fig. 1).

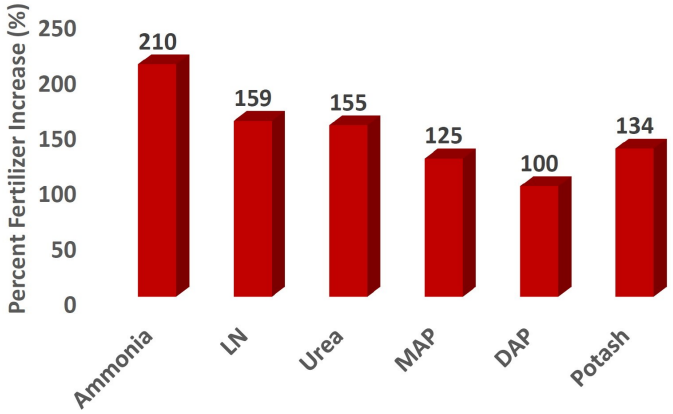

Figure 1. Percent increase in fertilizer prices compared to September of 2020. LN = Liquid Nitrogen; MAP = Mono-ammonium Phosphate; DAP = Di-ammonium Phosphate. Source: Myers and High, 2021.

Based on current prices (Fig. 2) and the uncertain future, we must become more conscious about how we apply fertilizer and the return in forage systems. Forage crops export far more nutrients off the field than grain crops because most of the above-ground growth is removed as hay. Forage and livestock producers are used to applying fertilizers without knowing the needs of existing forage crops and without knowing the soil nutrient reserves that are available. Most of the losses in a forage production system are due to improper fertilization that is done by implementing a blanket application. To have a better understanding of fertilizer needs and cost, producers should concentrate on getting a soil sample that could allow developing an efficient production system. Producers should collect a representative soil sample in field sections no greater than 10 acres and to a minimum depth of six inches. If legumes are present in the pasture, the percent of legumes and species in the stand should be included to obtain a more effective fertilizer recommendation.

Fertilizer efficiency will depend on several factors such as soil type, weather conditions, existing soil nutrient levels, soil pH, fertilizer type, application rate, forage type, etc. Figure 3 represents the possible yield responses based on your soil nutrient levels. Commonly, there is a linear increase in forage production with nitrogen (N) application. On the other hand, phosphorous (P) and potassium (K) had a 95 to 100% response with a very low soil level, 70 to 95% response at a low level, and 40 to 70% response with a medium level.

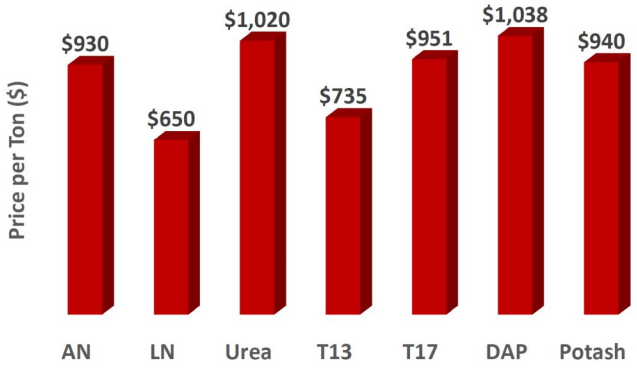

Figure 2. Upper fertilizer prices across the southern USA. AN = Ammonium Nitrate; LN = Liquid Nitrogen (28%); Urea (46-0-0); T13 = Triple 13 (13-13-13); T17 = Triple 17 (17-17-17); DAP = Di-ammonium Phosphate (18-46-0). Source: Garcia and Young, 2022. USDA-AL Dept of Ag Market News.

Financial constraints commonly limit fertilizer use by forage and livestock producers as they strive to maximize net returns on their investments. Understanding soil test levels will help develop a fertilizer plan to make the wisest economic application. There are different fertilizer sources and some blended fertilizers like triple 13, triple 17, and poultry litter that might be easier to apply, but you might be applying a nutrient source that you might not need if a soil sample is properly collected. Keep in mind that poultry litter could be a good source of P

Table 1. Economic analysis of different fertilizer combinations to fertilize annual ryegrass with a soil pH of 6.0 and medium soil test level for P and K. The fertilizer recommendation in 50 lb N, 30 lb P_2O_5, and 30 lb K_2O per acre.

Fertilizer Strategy	Price ($/ton)	Price ($/lb)	Product Applied (lb/ac)	Price ($/acre)
Blended Fertilizer				
13-13-13	$735.00	$2.83	385	**$141.50**
17-17-17	$951.00	$2.80	294	**$140.00**
Mixed Fertilizer				
Urea (46-0-0)	$1,020.00	$1.11	82	$41.07
DAP (18-46-0)	$1,038.00	$1.13	65	$33.90
Potash (0-0-60)	$940.00	$0.78	50	$23.40
Total				**$98.37**
Poultry Litter				
3-3-2	$60.00		4,167	**$125.01**

and K when tested to determine the application rate. Most of the nitrogen in the poultry litter is trapped in the organic matter which requires microbial activity to break it down over time and some might be used by the microbes. Nitrogen availability in poultry litter ranges from 30 to 40% depending on poultry litter source and meaning that an additional N application might be required to achieve the recommended N rate. Table 1 provides an example in which a soil sample can cut costs and help choose the correct fertilizer source. In this example, there is the assumption that pH is optimal. If a soil sample recommend a lime application, it might be best to concentrate on adjusting the pH before considering the application of other nutrients. Values in Table 1 indicate that choosing a blended fertilizer is 43% more expensive than developing a fertilizer mix. Producers are paying for a convenience that we cannot afford these days. On the other hand, if a producer chooses to apply poultry litter and assumes that 40% of the nitrogen will be available, there will be a need to apply 2.1 tons per acre. That means that this approach will be 27.1% more costly than using a mixed fertilizer.

Developing a well-managed and efficient forage fertilization program that can increase profitability routinely depends on soil testing as well as maintaining records of the applied fertilizers and nutrient removal. Choose a fertilizer mix that can give you the needed nutrients, but also provides an economic advantage. Contact your local County Extension Office to collect the proper soil sample and develop a suitable fertilizer plan.

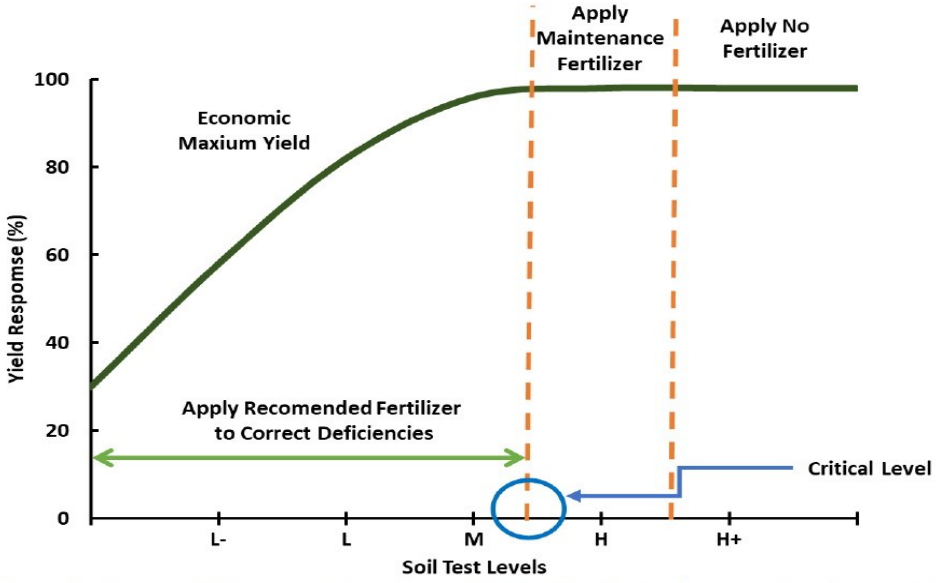

Figure 3. Forage yield responses based on soil test nutrient levels. L- = very low; L = Low; M = Medium; H = High; H+ = Very High.

Upcoming Events

Sheep and Goat Production Webinar Series (6:00 PM to 7:00 PM CST)
Registration Required

Jan 18, 2022— **Addressing Reproductive Issues in Goats**
Registration at https://bit.ly/2022_Jan18SGPW

February 1, 2022— **Developing a Grazing Plan for Your Farm**
Registration at https://bit.ly/2022_Feb01SGPW

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