

FOR IMMEDIATE RELEASE

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Pasture Fertilizer Calculations

Fertilizer ratios indicate the percent of nutrients, by weight, in a particular fertilizer. Ratios are always given as the percent nitrogen (N), phosphorus (P), followed by potassium (K), in this order. For example, a 10-10-20 fertilizer contains 10% N, 10% P and 10% K. Pulling out our producer calculator, this means that 100 pounds of this fertilizer will actually contain 10 lbs of nitrogen, 10 lbs of phosphorus and 20 lbs of potassium.

Nitrogen is critical for maximum growth of grasses and associated with plants dark green color. Urea is one of the most common sources of N in our area. It is 46% N, and not very stable so must be applied when rain is expected within several hours. If it doesn't rain within 24 hours, 66% of the nitrogen will be lost to the atmosphere. Applying 100 lbs. of urea to an acre will supply 46 lbs. of N. Ammonium nitrate is a more stable form of nitrogen; it can be applied to the soil surface anytime without an appreciable loss of nitrogen. Applying 100 lbs. of ammonium nitrate supplies 34 lbs of N. However, ammonium nitrate is expensive and is difficult to work with.

Adequate phosphorus ensures stem strength and root growth. A soil test is necessary to determine how much P is needed. Diammonium phosphate, commonly known as DAP can be applied directly to a pasture. Since DAP has a ratio of 18-46-0, applying 100 lbs. supplies 46 lbs. of P per acre, and to complicate fertilizer rate calculations, this same 100 lbs. also supplies 18 lbs. of nitrogen.

Potassium is critical for stalk strength, disease resistance and winter hardiness. Deficiency symptoms are reduced plant strength and growth. A soil test is needed to determine K requirements. Muriate of potash, at a ratio of 0-0-60, can be applied directly to pastures. Potash, as it is commonly known, has a fairly high salt content. Applying 100 lbs. of potash supplies 60 lbs. of K per acre.

Let's work through an example of phosphorus. Results are presented from K-State Soil Labs in parts per million, abbreviated as ppm. A soil test reveals that there are 2 ppm in a fescue pasture, and optimum is 20 ppm. We use an equivalency factor to get that ppm converted to actual phosphorus, generalized as P₂O₅. Converting our known 2 ppm to actual P per acre, we find that

an additional 55 lbs. of actual P needs to be in the soil. In reality, the fertilizer available is not pure P though, so we use DAP at 46%.

$$55 \text{ lbs} / 46\% = 120 \text{ lbs.}$$

So, we have to apply at least a 120 lbs. of DAP, per acre, to satisfy the P requirement for fescue.

Since we have applied a 120 lbs. of DAP, we have to also account for the 18% nitrogen, as it will impact our urea rate.

$$18\% \times 120 \text{ lbs.} = 21.5 \text{ lbs. of N has been applied from DAP}$$

This amount has to be subtracted from the actual nitrogen still needed. Each type of forage has different needs.

These concepts and common lingo can make rate calculations confusing. Feel free to give me a call to discuss options at the Wildcat District Altamont office at 620-784-5337.

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