

Is Poultry Litter a Good Idea for Fall Grazing?

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In the southeast, the opportunity to extend grazing into the cool seasons is one benefit of our area. Whether grazing an established fescue grass pasture, annual legumes or drilled-in ryegrasses, or small grains like oats, wheat or rye, or some mixture of these (Dillard 2023), the ability to graze a growing crop is often seen as more desirable than early feeding of hay and supplements. No matter what your choice of grazing crop is this Fall, proper soil fertility is always paramount if you are to expect good yield. In much of Alabama, poultry litter application to Spring pastures is a common practice to boost soil fertility and increase grazing yields. This might lead one to the obvious question – “Does applying poultry litter to cool season grazing make sense too?”

To arrive at the answer, one must consider several factors. First, one must choose a forage crop and know the soil nutrient requirements of the chosen forage. Then you must compare that choice to soil fertility. This requires a soil test of the pasture. Valuable knowledge to assist in these efforts can be found at www.ACES.edu or talking with your local Alabama Cooperative Extension System agent/forage specialist. When we know what we want to plant, what we need for good yield, and know what our soil has available, only then can we make a good decision on how to meet any deficiency.

It is commonly accepted that poultry litter has nitrogen, phosphorus, and potassium (N-P₂O₅-K₂O) makeup of approximately 3-3-2, or 3% N, 3% P₂O₅ and 2% K₂O (Griffin 2021.) However, this is highly variable and dependent upon multiple factors. In other words, just because you have 1 ton of litter does NOT mean you necessarily have 60 pounds of N, 60 pounds of P₂O₅ and 40 pounds of K₂O available to the crop. Those numbers reflect the total amount of nutrients present in the litter. However, a large portion of those nutrients, especially nitrogen, are present in organic form and must be broken down for plants to use. Plants lack the capability to metabolize the organic form of nutrients; hence most nutrients are broken down into simpler or plant available forms by soil microbes. This process is known as mineralization. Mineralization is a slow process and is dependent on several factors such as soil type, soil temperature, soil moisture, and carbon-to-nitrogen ratio of poultry litter.

The nutrient content of litter can also fluctuate and is generally recognized as increasing with the number of flocks grown on the litter. This is especially true for “total clean-out litter” – where a poultry house is totally cleaned to the ground after two-three years and multiple flocks are raised, and that litter is spread. However, if the litter in question is “de-cake litter,” it is likely going to be high moisture and low in nutrient value of only one or two flocks of grow-out time. Moreover, even if those above amounts existed in the expected ratio, they may not be readily available to the plants due to the slow process of mineralization. Fall litter applications are also prone to runoff or leaching due to higher rainfall rates, and the nutrients pass through the soil before the plants can utilize them. Additionally, cooler winter temperatures further slow the mineralization process potentially creating a mismatch of nutrient release and plant demand. All these factors impact litter’s plant food potential and affect how much one should consider paying for it.

For example, we will make a few assumptions to help us determine if we should consider poultry litter for Fall application. Often nitrogen is the focused-on plant food for these short-lived annual crops. First, we will assume ryegrass is our chosen forage and we are targeting about a ton per acre in biomass production. Research has shown that some varieties of ryegrass take at least 30 lbs. of N per acre to achieve this goal (Balkcom 2019.) At first glance, it looks like that would require 1000 lbs. (one-half ton) of litter per acre at the 3-3-2 ratio. If we assume the cost of commercial ammonium nitrate (34% N) is \$700 per ton and is spread on the pasture at a rate of 90 lbs. per acre to achieve 30 lbs. of N per acre, it costs \$32 per acre. In that case, litter would need to cost no more than \$64 per ton spread (\$32 per half-ton) to equate to commercial ammonium nitrate per acre on a nitrogen basis alone.

On the practical side of this decision is the fact that our above rate of one-half ton per acre of litter is not accurately achievable by most litter spreading equipment. Typically, a rate of two tons per acre of litter is spread, which puts our resulting litter cost at \$128 per acre (assuming \$64/ton.) As we discussed, with the potential problems with Fall litter applications, two tons per acre may be the required rate on a nitrogen basis

anyway and would further put Fall applied litter in a cost-prohibitive category. Another practical side of the story is that it is uncommon for poultry growers to perform full clean-outs of their houses during the Fall; therefore, it is likely that only de-cake litter would be readily available. This simply means that the best litter with the most potential plant food is often not available in the Fall.

It should be recognized that poultry litter has more than just nitrogen available for plants and that should be a positive consideration for using it in the Spring. However, for the reasons outlined here, it is usually not recommended for Fall grazing fertilizer needs. Commercial fertilizers are likely your best bet to maximize your cool season forage crops. Poultry litter can still be used in the Spring with much better results to be expected.

For more information on poultry litter as fertilizer, see:
Prasad, Rishi; Stanford, Kent. - "Nutrient Content and Composition of Poultry Litter." <https://www.aces.edu/blog/topics/farming/nutrient-content-and-composition-of-poultry-litter/>

References:

- Balkcom, Kip; Gamble, Audrey. - "Cereal Cover Crop Response to Nitrogen Fertilizer" <https://www.aces.edu/blog/topics/row-cover-crop-soils/cereal-cover-crop-response-to-nitrogen-fertilizer/>
- Dillard, Leanne. - "Extending Winter Grazing with Cool-season Annual Mixtures" <https://www.aces.edu/blog/topics/farming/extending-winter-grazing-with-cool-season-annual-mixtures/>
- Griffin, Megan; et. Al. - "Pasture and Grazing Management Guide" <https://www.aces.edu/blog/topics/farming/pasture-and-grazing-management-guide/>



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