Manure Credits on Pasture

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Manure provides significant quantities of nutrients to crops which are grown following its application. Manure crediting is commonly used to determine nutrient needs for row crops. Nutrient credits from manure are considered less often in pasture systems.

Nitrogen and phosphorus (P_2O_5) in unincorporated dairy manure, as would be present in grazing herds, are 3 lb/ton for each nutrient. Estimates of manure production by lactating dairy cows varies with size. For a 1400 lb lactating dairy cow (larger than most grazing cows), manure production is estimated at 148 lb/day. Using these values, 60 grazing animals on a 7 acre paddock for 2 days would produce 8.8 tons of manure. This would provide 27 lb of available P_2O_5 and 27 lb of available nitrogen. Spread over 7 acres, this amounts to 3.8 lb of each nutrient/acre. If these animals grazed the paddock 5 times in a season, they would provide a total of 19 lb nitrogen and 19 lb P_2O_5 per year.

Nitrogen and phosphorus recommendations vary according to soil test levels, organic matter and yield goals. Recommendations for P_2O_5 are typically in the 30-40 lb/acre range while nitrogen recommendations are 100-150 lb/acre. Considering this, it becomes obvious that manure supplied by grazing animals is unlikely to provide the level of fertility that pastures need for optimum production. This is particularly true for nitrogen. Even if one considers the additional 7-10 lb of nitrogen from manure provided by young stock following the grazing herd, the total is still far less than is required for maximum productivity. In addition, manure distribution in pastures is likely to be concentrated in shade areas and around water tanks, further decreasing the amount of nutrients available to growing plants.

Mechanical spreading of manure from winter feeding is another source of nutrient credits on pasture. Calculations of these credits would be done in a similar manner as that described above. Calibration of a manure spreader is a good use of time and facilitates accurate crediting. Some additional considerations when mechanically spreading manure on pastures include:

- Apply before active growth or soon after grazing
- Apply where soil phophorus and potassium are lowest
- Time applications to minimize soil and plant damage
- Limit rates to 10 tons solid or 5000 gallons liquid manure/acre to avoid plant burn

Nutrients supplied by manure as well as those provided by legumes should be accounted for when building a fertility program for pastures. Soil tests, along with estimates of manure amounts applied (whether mechanically or from grazing animals), provides a guide for accurate nutrient applications which will maximize production, save money and protect the environment.