FIELD DAY REPORT - 1993

Texas A&M University Agricultural Research and Extension Center at Overton

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FERTILIZING PASTURES WITH POULTRY LITTER

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Background. Broiler production has increased 70% in Texas since 1984. Poultry houses, which are usually cleaned out once a year, generated 1,220,000 tons of litter during 1991 in Texas. The major use of poultry litter is to fertilize agricultural land. Pasture is the main recipient of poultry litter in East Texas since most of the land is not suited for crop production.

Safe application of animal waste to agricultural land is based on the principle that the application rate (soil nutrient loading) does not exceed the nutrient requirements of the crop. Excessive amounts of mobile nutrients such as nitrates, sulfates, and boron can move past the root zone and be lost to the plants. Nitrates can leach into surface and groundwater causing pollution. Profitable and safe use of poultry litter on pasture is dependent on knowing the nutrient content of the soil, nutrient content of the litter to be applied, and nutrient requirements of the forage crop.

Current Information. Nutrient status of the soil will vary because of soil type, past fertilization practices, and if the pasture was utilized for hay production or grazing. Nutrient composition of poultry litter will vary depending on the type of poultry, number of flocks on the litter, poultry feed composition, and treatment of the litter after removal from the poultry house until spread on the pasture. The average and range in nutrient composition of poultry litter from 147 houses in Alabama are reported in Table 1. The wide range in nutrient composition demonstrates the importance of having poultry litter analyzed when appyling to agricultural land.

About 60-65% of the nitrogen in poultry litter applied on the pasture surface is available the first year. About 25-30% is ammonia nitrogen which is lost as a gas. This free ammonia gas gives poultry litter the obnoxious odor. The remaining 10% is not available until the second year. An estimated 75% of the phosphorus and potash in poultry litter is available. Available nutrients from applying four rates of poultry litter containing 62-59-40 of N-P-K are reported in Table 2.

Recommendation. The N-P-K ratio for fertilizing bermudagrass and bahiagrass pastures is 3-1-2. Only using poultry litter to meet the nitrogen requirements of the grass would result in a buildup of unused phosphorus. Commercial nitrogen and potash fertilizer should be used in combination with poultry litter to better utilize all the nutrients in the litter. If a hay field is to be cut twice and then grazed, two to three tons of poultry litter, depending on nutrient content, should be applied in spring. After the first hay cutting, equal amounts of nitrogen and potash fertilizer should be applied to use the excess P for a second hay cutting.

Table 1. Nutrient composition of litter from 147 broiler houses in Alabama. (Payne and Donald, Alabama Agric. Ext. Ser. Cir. ANR-580).

Nutrient	Analysis on an 80% dry wt. basis	
	Average	Range
	----------lb/ton----------	
Nitrogen (N)	62	34 - 96
Phosphate (P_2O_5)	59	22 -142
Potash (K_2O)	40	13 - 99
Calcium (Ca)	35	13 - 98
Magnesium (Mg)	8	3 - 34
Sulfur (S)	6	0.2 - 13

Table 2. Available nutrients from varying rates of poultry litter.

Nutrient	Pounds Ton	Availability	Tons/acre			
			1	2	3	4
		%	----------available nutrients/acre----------			
N	62	60	37	74	111	148
P_2O_5	59	75	44	88	132	176
K_2O	40	75	30	60	90	120