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ECONOMIC VALUE OF POULTRY LITTER AS FERTILIZER FOR VEGETABLE PRODUCTION

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Background. In recent years, poultry production in the United States has increased at the rate of 5% per year. Increase in per capita consumption has been the primary driving force. Per capita broiler consumption in the United States for 1973, 1983, and 1993 was 37, 50, and 78 lb, respectively. Rising broiler exports accounted for 9 percent of the US broiler production in 1993. Hong Kong, former USSR countries and Japan are the major importers. Broiler production in Texas increased 50% from 1986 to 1992.

Broiler houses are cleaned out every 12 to 24 months. Broiler litter is a mixture of poultry excreta, feathers, wasted feed and bedding material, which in East Texas, is usually pine wood shavings, sawdust, or rice hulls. Over 95 percent of the poultry litter produced in the United States is applied to agricultural land as fertilizer. Depending on the cost, poultry litter can be an economical alternative to commercial fertilizer for East Texas vegetable crops.

Current Information. Nutrient content of poultry litter is quite variable. The average and range of six nutrients in samples from 147 poultry houses in Alabama is reported in Table 1. Variation is due to feed ration, number of batches of broilers since last clean out, type of waterers, and poultry house management. Poultry litter from houses equipped with straw waterers and with at least 4 to 5 batches of broilers since last clean out should be average or above in nutrient content. Manure from breeder or laying houses contains from 40 to 70% moisture compared to 20 to 25% moisture in broiler litter. Since one buys from 2 to 3 times as much water in manure from laying houses, there are fewer nutrients per ton and therefore is worth less than litter from a broiler house.

Advantages of poultry litter over commercial fertilizer are 1) slower nitrogen (N) release which reduces nitrate leaching, 2) additional nutrients besides N, phosphorus (P) and potash (K), 3) contains calcium which decreases soil acidity, and 4) the added organic matter improves the water and nutrient holding capacity of the soil. If the poultry litter is worked into the soil immediately after application, from 85% to 90% of the N is available the first year and the remaining 10-15% is available after the first year. Essentially all the P and K is available to plants. The value of a ton of poultry litter is determined by the amount of N, P and K per ton and fertilizer prices. Estimating 85% of the N and all the P and K is available the first year and the cost of N is 33¢/lb, P is 16¢/lb and K is 13¢/lb, the average ton of poultry litter from Table

1 has a value of \$32.13. This assumes all the N, P and K will be utilized by the crop.

Recommendations. Because of the variability in nutrient content of poultry litter, a sample should be sent to a university or private lab for analysis. By knowing the fertilizer requirements of the crop and the nutrient content of the litter, the proper rate of poultry litter to apply can be calculated. The rate for most vegetables will be about 2 tons/acre. The average N:P₂O₅:K₂O ratio of poultry litter is about 1:1:1. If the vegetable crop requires more N and/or K than P, commercial fertilizer should be used. If the higher N or K needs are met with poultry litter alone, soil P levels will increase which could lead to environmental problems.

Table 1. Average and range of nutrients in 147 poultry litter samples (80% dry matter basis) in Alabama (Auburn Univ., Auburn, AL Circular ANR-580).

Nutrient	Average	Range
	-----lb/ton-----	
Nitrogen (N)	62	34-96
Phosphate (P ₂ O ₅)	59	22-142
Potash (K ₂ O)	40	13-99
Calcium (Ca)	35	13-98
Magnesium (Mg)	8	3-34
Sulfur (S)	6	0.2-13