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Value of Nutrients in Poultry Litter When Applied in the Fall

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The value of nutrients in poultry litter depends not only on how much nitrogen (N), phosphorus (P) and potassium (K) it contains, but also on how it is handled and applied. The following table compares the value of 19 poultry litter samples from Hopkins County analyzed for N, P & K and the litter then spread in the fall. The samples include pullet, breeder and broiler manures, with storage times up to one year. Nutrient values were based on a comparison with urea (46-0-0) at \$199/ton, triple super phosphate (0-46-0) at \$215/ton and muriate of potash (0-0-60) at \$165/ton.

Research has shown that only 15% of the total nitrogen contained by poultry litter applied in the fall without a cover crop will be available to the next year's corn crop. This is because the nitrogen that is released during the fall and winter is likely to be lost due to denitrification and leaching that occur with

Kentucky's climate. Available nitrogen will be about 50% of the total if a cover crop such as wheat is used and killed prior to planting corn. The cover crop takes up the nitrogen as it becomes available and prevents it from being lost. As the cover crop decomposes, nitrogen is released back into the soil. If poultry litter is applied to pasture in the fall, it is estimated that the N it contains will be 80% as effective as N from commercial fertilizer. Since many pasture species stay green all year, they will take up nitrogen as it is released from the litter, reducing chances for loss. Assuming all the phosphate and potash in chicken litter will be as available as P and K from commercial fertilizers (which is true, in the long run), and that the application rate does not exceed the fertilization recommendation for any of the nutrients, then we can calculate litter values as shown in the following table.

Value of N, P and K in Poultry Litter Samples from Hopkins County When Applied
in the Fall

Litter Analysis (lbs/T)			Value (\$/T)		
N	P ₂ O ₅	K ₂ O	Next Year's Corn		
			No Cover Crop	Cover Crop	Pasture
46	83	45	26.91	30.45	33.49
62	73	54	26.40	31.17	35.26
29	53	29	17.21	19.44	21.35
74	78	59	28.64	34.34	39.22
40	64	36	21.08	24.16	26.80
42	53	42	19.46	22.69	25.46
71	66	50	24.52	29.99	34.68
32	70	49	24.02	26.48	28.59
67	73	70	28.80	33.96	38.38
49	74	61	27.18	30.95	34.18
41	63	53	23.26	26.42	29.13
45	68	48	23.85	27.31	30.28
36	82	43	26.07	28.94	31.22
30	45	45	17.64	19.95	21.93
42	64	45	22.41	25.64	28.47
38	59	51	21.96	24.89	27.40
35	63	49	22.51	25.20	27.51
30	64	41	21.45	23.76	25.74
45	68	53	24.55	28.01	30.98
Av. 45	66	49	23.53	26.99	29.96

The first thing that stands out in these results is the extreme variability in nutrient content. Part of the variability is due to differences in type of poultry (broiler, pullet, breeder) and part is due to litter management. However, it does represent the statewide variability that occurs. Nitrogen content ranged from a low of 29 pounds per ton in litter that had been stored for a year, to 74 pounds per ton in a fresh litter sample, with an average of 45 pounds of N per ton. Phosphate ranged from 45 to 83 pounds per ton and averaged 66 pounds per ton. Potash averaged 49 pounds per ton, with a range of 29 to 70 pounds per ton. The value of nutrients was as low as \$17.21 per ton when no cover

crop was used to \$39.22 per ton when the most nutrient-laden litter was used on pasture.

The conclusion is that since the nutrient content of poultry litter is so variable, the only way to determine its nutrient value is by taking a sample and having it tested. Litter samples can be sent through the County Cooperative Extension Service office for testing for a fee of \$20 per sample. Extension will also make recommendations on how much litter to use and how to balance crop nutrient needs, using fertilizer, if needed.

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