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FERTILIZER VALUE OF CATTLE DUNGHILLS IN A PASTURE FIELD

K. L. Wells and Steve D. Davis

There were nearly 2.5 million cattle and calves in Kentucky in 1988. Most of these were maintained under pastureland conditions. Nutrients taken up by pasture plants, consumed by cattle, and re-cycled back onto fields by fecal and urine excretions can be a major source of nutrients for maintaining pastureland productivity. In order to estimate the value of this under grazing conditions, observations were made on a pasture field in Casey County, Kentucky, following stocking of the field with cattle.

An ungrazed 15-acre pasture field of largely tall fescue and a lesser amount of ladino clover was stocked with 25 angus heifers of about 700-pound size. These pasture plants were the only source of feed for the animals. After 14 days of grazing, random counts of dunghills were made in the field. Since the objective was to estimate the distribution of dunghills on the effectively grazed portion of the field, areas near the water supply, shade, and gates where cattle tend to periodically congregate were not included in making the counts. No attempt was made to measure urine deposits since their location is almost impossible to identify in the field. A freshly deposited dunghill was collected, frozen in order to stop decomposition, and analyzed for nutrient and moisture content. The estimate made for nutrient re-cycling in this report was based on this analysis and the distribution of dunghills deposited by the 25 animals during the 14-day period. Results are summarized as follows:

stocking rate-----	1.67 head/A
grazing period-----	14 days
number of dunghills/A deposited-----	3,702
area covered per dunghill-----	1 sq. ft.
total area covered by dunghills-----	8.5%
dry weight per dunghill-----	0.3835 lbs
analysis of freshly deposited dunghill (dry weight basis)	
Total N-----	1.93%
NH ₄ -N-----	0.57%
NO ₃ -N-----	0.06%
P-----	0.62%
K-----	1.06%

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The fertilizer value of the dunghills should be considered in two ways:

- (1) **The amount of nutrients applied only to the soil covered by dunghills.** After 14 days grazing, the 1.67 head stocking rate per acre had resulted in an average dunghill coverage of 8.5 percent of each acre. The area covered by the 8.5 percent of each acre thereby received an equivalent of 322-237-212 pounds per acre of N-P₂O₅-K₂O, respectively.
- (2) **The amount of fertility per acre if the dunghills were uniformly spread.** After cattle have been removed from a field following a grazing period, the dunghills should be spread as uniformly over the field as is possible in order for the re-cycled nutrients to be most effectively used over the entire field. Chain drag harrows are the best tools for this use. If all the nutrients measured in the situation described above were uniformly spread, the per acre fertility value would be 27-20-18 pounds per acre of N-P₂O₅-K₂O, respectively, for the dunghills deposited in a 14-day period. This rate is roughly equivalent to 200 pounds per acre of 10-10-10 grade fertilizer.

In terms of economic value, the nutrients re-cycled during a 14-day period onto the grazed area of the pasturefield were worth about 10 to 12 dollars per acre (at 20-cent N, 15-cent P₂O₅, and 10-cent K₂O).


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