HAWAII COOPERATIVE EXTENSION SERVICE
College of Tropical Agriculture and Human Resources
University of Hawaii
GENERAL HOME GARDEN SERIES No. 2

CHICKEN MANURE

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The value of manure as a source of plant nutrients has long been recognized, and poultry manure is a concentrated plant food containing two to three times as much nitrogen, three to five times as much phosphorus, and about the same amount of potassium as other farm manures. In addition to being a valuable source of plant nutrients, chicken manure is an important soil conditioner, and it increases the soil's moisture-holding and nutrient-holding capacities.

Manure Production

Fresh manure contains about 76% water. The weight of fresh manure voided by hens is slightly less than two times that of the feed consumed. One hen will produce 130 pounds of manure in 1 year, or 1000 hens will produce 65 tons. On the dry basis as sold (approximately 30% water), this amounts to about 51 pounds per hen or 25 tons for 1000 hens per year.

Composition of Chicken Manure

The composition of chicken manure varies according to age of the chicken, moisture content and age of the manure, kind and amount of litter, and storage and handling practices. The only sure way to know the compositon is to analyze the material. Table 1 presents some data on the composition of manure from caged layers.

In addition to the major plant food nutrients and the organic matter content, manure contains many secondary plant foods. Table 2 presents the average amounts of these plant foods in fresh chicken manure.

Table 2. Composition of secondary and micronutrients in fresh chicken manure (%)[1]

Nutrient	Amount
Calcium	3.200
Magnesium	0.290
Sulfur	0.310
Iron	0.046
Boron	0.060
Copper	0.002
Chlorine	0.080
Manganese	0.089
Molybdenum	0.006
Zinc	0.090

[1]Data from Florida Agr. Exp. Sta. Circ. S-140 and Michigan Coop. Ext. Serv. Bull. 231.

The value of chicken manure decreases with age. Those manures that are several years old have little nutritive value, but they serve as excellent organic soil amendments.

How to Preserve Manure

Nutrient loss from manure may be prevented by proper handling and storage. Materials that may be used to prevent the loss of nutrients from chicken

Table 1. Composition of chicken manure (%)[1]

	Wet basis					Water-free basis				Usual commercial basis[2]				
Age	Water	N	P_2O_5	K_2O	O.M.[3]	N	P_2O_5	K_2O	O.M.	Water	N	P_2O_5	K_2O	O.M.
Fresh	76.0	1.6	1.1	0.5	19.1	6.7	4.5	2.0	79.6	30	4.5	3.0	1.3	53
10 wk.	67.5	1.2	1.2	0.9	20.9	3.6	3.6	2.7	64.1	30	2.4	2.4	1.8	43
6 mo.	46.0	1.9	2.4	1.3	28.5	3.3	3.8	2.1	61.0	30	1.9	2.4	1.3	28.5
1 yr.	25.5	1.1	1.0	0.6	37.0	1.4	1.2	0.8	29.4	25.5	1.1	1.0	0.6	37.0

[1]Data from Hawaii Coop. Ext. Serv. Circ. 390, Florida Agr. Exp. Sta. Circ. S-140, and Connecticut Agr. Exp. Sta. Progress Rep. No. 12. All chicken manure is variable in composition. It should be purchased only on the basis of the manufacturer's guarantee.

[2]"Usual commercial basis" denotes the material after air drying, pulverizing, and packaging.

[3]O.M. denotes organic matter content of the manure.

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manure are single superphosphate; a mixed fertilizer, such as 0–15–30, and hydrated lime. The recommended rate is 100 pounds fertilizer per ton of fresh manure or 2 pounds of fertilizer sprinkled on the droppings from 100 birds. Superphosphate is most effective for preventing nitrogen loss, and hydrated lime is the most effective deodorizer. Hydrated lime increases nitrogen losses from manure. Stored manure should be protected from bad weather to prevent the loss of soluble nutrients by leaching.

Availability of Nutrients

Chicken manure contains both organic and inorganic forms of the plant nutrients described in Tables 1 and 2. Nitrogen occurs as ammonia and uric acid. The uric acid converts to urea, and the urea rapidly decomposes to ammonia gas, which causes the stron offensive odor often noticeable with chicken manure. Use preservatives or litters to prevent the loss of ammonia gas. Conversion of the uric acid and urea to ammonia is rapid during the first 2 weeks after the addition of manure to a warm moist soil, but conversion of the organic forms of nitrogen to an available form is slow during the first 4 weeks after its addition. About 60% of the nitrogen becomes available during the first 6 weeks in the soil; the remaining nitrogen is converted very slowly and may not be available until the next crop or season.

Phosphorus is primarily organic and becomes available as the manure decomposes, but all may not be available until the next crop or season.

Potassium is present in the inorganic form and readily available to plants. Proper handling is required to prevent the loss of potassium and other soluble nutrients by leaching.

Other plant nutrients become available during decomposition of chicken manure and, like phosphorus, may not all be available until the next crop or season.

Use of Chicken Manure

Chicken manure may be applied to the soil fresh or at any age. In general, commercially available manure is air dried, pulverized, and packed in plastic bags of varying sizes. The manure may be scattered on the surface of the soil and worked in with a rotary tiller, plow, spading fork, shovel, or similar tool. It should be mixed thoroughly and evenly so no "pockets" of unmixed material remain in the soil and applied in rows or hills as recommended for the type of crop grown. The manure should be mixed with or covered by soil to prevent offensive odors. Chicken manure, used wisely, brings excellent results as a top dressing for pasture and turf. It may be used in potting mixtures for container-grown plants, and it may be used to increase the growth of flowers, fruits, and vegetables in home gardens.

Chicken manure must be applied with care as it may "burn" plants if used in large amounts, if placed too close to plants, or if planting follows too soon after application. It should be mixed with the soil at least 1 week before planting when applied at the rate of 5 tons per acre (23 pounds per 100 square feet) or less and 2 weeks for greater amounts.

Generally, 3 to 10 tons manure per acre of garden area is recommended. For small areas, 14 to 46 pounds manure per 100 square feet soil is suggested. For individual crops, such as tomatoes and papaya, apply 1 heaping shovel manure per plant. For container-grown plants, mix 1, 2, or 3 teaspoonful in the soil for 4-, 6-, or 8-inch pots, respectively. For trees and shrubs, apply 5 pounds manure for each 1 inch in diameter of the plant. Exercise care that no manure is in contact with plants when applied.

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Reprinted June, 1980—2M

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