



University of Nevada
Cooperative Extension

Fact Sheet 13-23

Using Chicken Manure Safely in Home Gardens and Landscapes

Raymond Saliga III

The Greenhouse Project Operations Manager

JoAnne Skelly

Extension Educator, Carson City / Storey County

Introduction

Raising chickens at home is making a comeback. While a chicken can produce an egg every 24 hours, the average hen produces something else in abundance, one cubic foot of manure every six months (Anderson, 2010). With more than one hen, this rapidly adds up to a significant amount of manure that has to be managed. It can't continue to collect in the coop, or it will harm the chickens.



Raising chickens at home has increased in popularity. (photo: W. Hanson-Mazet)

What does a homeowner, particularly one who lives in an urban environment, do with all that manure? The answer is to use it as a soil amendment or fertilizer.

However, raw chicken manure can burn and damage plants. It should be composted or aged prior to use. In addition, raw manure can contain pathogens that can harm people and animals. If composting is done properly, the process destroys disease-causing organisms, making chicken manure safe to use around plants, people and pets.

Composition

What comes out of a chicken coop isn't simply fecal matter. It also consists of urine, feathers, undigested food and coop bedding material. Composting decomposes these materials into a form that is good for plants.

Benefits

Composted chicken manure provides a slow-release source of macro- and micronutrients and acts as a soil amendment. Compared to other manures, chicken manure and the associated litter are higher in nitrogen, potassium, phosphorus and calcium, and are also rich in organic matter (Zublana, 1993). Addition of organic matter to soils increases a soil's water-holding capacity, improves aeration and drainage, reduces erosion, reduces fertilizer leaching and improves a soil's structure.

Additionally, organic matter provides a food source for soil microbes, which increases soil biological diversity, accelerating the breakdown of organic nutrients into forms more readily available to plants. All of these factors can improve plant health (Rosen, 2005).

The use of composted manure and litter can also reduce the need to apply additional fertilizers.

Safety

Like other animal wastes, chicken manure and litter may harbor pathogens, such as *E. coli*, *Salmonella*, *Cryptosporidium* and others. To reduce risk to humans and pets, proper handling and precautions are necessary. Stockpiled manure should be kept in a protected area where children, pets and livestock do not have access.

Before applying manure or litter to the garden, it should be composted or aged.

Proper composting will generate temperatures of 140 F to 160 F, which is enough to kill most human and animal pathogens, such as *E. coli* and *Salmonella* (Griffiths, 2011).

Aging the manure and litter only reduces populations of disease-causing microbes by providing unfavorable growing conditions that cause them to die off gradually due to changes in moisture content, temperature and nutrient availability. Pathogens are not actively killed by aging, but instead are inhibited from reproducing, which results in a slow decline of the population.

Whether composted or aged, manure should be applied no later than 90 days prior to harvest of non-ground-contact crops such as trellised tomatoes, cucumbers and peppers; and no later than 120 days prior to harvest of ground-contact crops such as lettuce, strawberries and carrots (Rosen, 2005).

Storage

When planning how to handle chicken manure and litter, one must consider the storage requirements needed. The size of the storage area will depend on the amount of litter produced, but should always be isolated from children, animals and rain. Liquid runoff should not be allowed to stand or pool and the pile should drain well to prevent unpleasant odors and the buildup of disease-causing organisms (Griffiths, 2005). Additionally, the storage area should not be located where runoff could contaminate vegetable gardens, edible plants or children's' play areas.

A laying hen will produce about a cubic foot (about 7.5 gallons) of litter every six months, which means a flock of 10 hens, will produce about three-quarters of a cubic yard per year. If stored, this would create a pile that is about 3 feet long, 3 feet wide and 2 feet high. However, composting or aging will reduce this volume by about half over time.

Composting and Aging

Chicken litter is high in nitrogen, and can be composted in about five to six weeks. Composting “cools” the manure and litter material, meaning it reduces the ammonia content so it will no longer burn plants. It also reduces the total volume, weight and odor of the pile. Additionally, composting stabilizes nutrients enabling a slow, long-term release over a few years. Finally, the temperatures generated in the composting process will kill most pathogens and weed seeds.

In residential areas, odors caused by manure piles can quickly become a nuisance to both the chicken owner and surrounding neighbors, if not properly managed. Foul odors usually occur when the interior of a pile has an inadequate supply of oxygen, allowing the proliferation of microbes responsible for unpleasant, sewage-like smells. When composting, adequate pile drainage must be maintained and the pile turned weekly to introduce oxygen. A well-managed compost pile should have an “earthy” smell, like good potting soil.

If a compost pile cannot be turned each week, a better approach may be to dry out and age the manure before adding it to a pile.

Removing the moisture from the manure inhibits microbial growth and decomposition, preventing the associated smells. Each time a coop is cleaned, the manure can be thinly spread on a tarp or other impermeable surface to dry in the sun, before adding it to the pile. The drying pile should be protected from precipitation or other water sources, or decomposition (and odors) may occur.

Safety Tips

- Only apply composted or aged manure to soil, unless it is applied the fall before planting.
- Always wear gloves when handling manure.
- Wash raw vegetables thoroughly before eating.
- People who are susceptible to foodborne illnesses should avoid eating uncooked vegetables from manure-amended gardens. Those who face risks from foodborne illness include pregnant women, young children and persons with cancer, kidney failure, liver disease, diabetes or AIDS (Anderson, 2010).

Conclusion

“Poultry manure, properly handled, is the most valuable of all manures produced by livestock” (Mitchell and Donald, 1995). When a family raises chickens, they have a ready supply of brown gold from composted or aged manure to benefit their garden and landscape plants.

References

Anderson, E. 2010. Using manure, including chicken manure, as compost. Community Horticulture Fact Sheet #25. Washington State University. Seattle, WA. [Online] Available at: <http://county.wsu.edu/king/gardening/mg/factsheets/Fact%20Sheets/Using%20Manure%20as%20Compost.pdf>

Griffiths, N. 2011. Best practice guidelines for using poultry litter on pastures. Primefact 534. Department of Industry Development, Agriculture & Forestry. New South Wales, Australia. [Online] Available at: http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0004/140359/Best-practice-guidelines-for-using-poultry-litter-on-pastures.pdf

Mitchell, C. C. and Donald, J. O. 1995. The value and use of poultry manures as fertilizer. Circular ANR-244. Alabama A & M and Auburn Universities. Alabama Cooperative Extension System. [Online] Available at: <http://hubcap.clemson.edu/~blpprt/Aub+244.html>

Rosen, C. J. and Bierman, P. M. 2005. Using manure and compost as nutrient sources for fruit and vegetable crops. Circular M1192. Department of Soil, Water and Climate. University of Minnesota Extension. [Online] Available at: <http://www.extension.umn.edu/distribution/horticulture/M1192.html>

Zublana J. P., Barker J. C., Carter T. A. 1993. Poultry manure as a fertilizer source. Publication AG-439-5. North Carolina Cooperative Extension Service. [Online] Available at: <http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-05/>

Copyright © 2013. University of Nevada Cooperative Extension. The University of Nevada, Reno is an Equal Employment Opportunity/Affirmative Action employer and does not discriminate on the basis of race, color, religion, sex, age, creed, national origin, veteran status, physical or mental disability, sexual orientation, or genetic information in any program or activity it operates. The University of Nevada employs only United States citizens and aliens lawfully authorized to work in the United States.