

DIGGING IN

## The Merits of Manure

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Special to The Washington Post

Thursday, October 13, 2005; Page H07

The best gardening practices are the old ones, arrived at by observing processes already at work in nature, and steering them to the gardener's advantage. These produce the best-tasting crops, with the safest and most economical use of resources. They contribute to the ongoing quality of the soil. They are easiest, because most of the work is done for you by sun, rain and millions of creatures great and small that live in and around your garden.

Fertilizing with animal manure is one such technique. Thousands of years ago gardeners observed that while grazing animals might improve the pastures with their droppings, animals confined to barns and paddocks produced a material that could then be spread on cropland -- with miraculous results. Seeds sprouted better, root systems were stronger, plants grew bigger and healthier, with higher yields. The Romans made ample use of manure in their agriculture, during the late Empire they built aviaries just to stockpile bird dung for this use.

Field crops and livestock go hand in hand. On traditional homesteads throughout the world, animals are kept not only for meat, milk and hides, but also for their excrement. The word manure, derived from the French words for "hand" and "work" -- originally meant tillage, once done with hand tools alone. Later the sense narrowed to the act of amending the soil for greater fertility, and in present-day America it refers specifically to the dung of farm animals. The era beginning with the domestication of the horse and ending with the domination of the horseless carriage was a great one for agriculture. (Imagine a form of transportation that produces rather than consumes a valuable natural resource.) The fabulous market gardens that once flourished near Paris owed much of their fame to ample horse manure from the city's stables. English farmer Thomas Smith, in his 1909 book "French Gardening," describes a soil composed entirely of well-decomposed manure, "into which a walking-stick can be easily thrust to a depth of eighteen inches." Soil quality like that is not achieved by spreading bags of 10-10-10.

. In fields and forests, manures from herbivores, such as cows, horses and sheep, continually enrich the soil. Garden compost is an imitation of this process, and it's wise to make manure 10 to 20 percent of your compost ingredients. Dog and cat droppings are not for the compost pile, and even livestock manure must be aged before using, to minimize "burning" of plants and to keep manured vegetables free of the risk of harmful bacteria.

Well-rotted manure is also spread directly on gardens. It should look dark and crumbly, without a manure smell. I apply it in fall, raking it lightly into the top several inches of the soil, then letting the frost break it up and mellow it further. In spring the sun's warmth

wakes up the microbes and makes the nitrogen more available -- just at the time my plants need that boost.

Gardeners tend to use whatever manure they can find -- if not from their own livestock then from whatever farm or stable is handy -- but many have a favorite type. I like horse manure because it's nicely balanced and comes with a lot of bedding, preferably straw. (Sawdust or shavings take too long to break down.) Other gardeners swear by cow manure, which is freer from weed seeds, and the one most often sold in bags. Some seek out donkeys -- their dung is well-decomposed because they chew their food slowly. Or llamas and alpacas, who poop in tidy piles. Bat guano has purported superpowers. Elephant is awesome -- if you can find it. (It's a main ingredient in the popular "Zoo-Doo," which the Woodland Park Zoo in Seattle portions out by lottery.) Sorry, no longer available at the National Zoo, said a spokeswoman.

Rabbit droppings are famously rich in nitrogen but must be used with caution. If high-nitrogen manure is too fresh, it can burn plants' roots. The same is true of bird manures, including that of chickens. Composting it thoroughly will minimize the problem. One product now widely available in bags is called Cockadoodle DOO from Pure Barnyard Inc. in Portsmouth, N.H. ( <http://www.purebarnyard.com/> ).

According to compost guru Will Brinton of Woods End Laboratories in Mount Vernon, Maine, the high levels of phosphorous in bird dung are even more of an issue than nitrogen. Ah, another man-made problem, one unknown to the Roman writer Varro, who in 37 B.C. awarded the dung of blackbirds and thrushes the highest praise. If a supply of either came my way I'd give it a try, but first I'd check my phosphorous levels with a soil test. A modern trick, but a good one.