

# GUIDELINES FOR USING MANURE ON VEGETABLE GARDENS

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Pathogens (microorganisms which cause disease) can be transferred from animal manures to humans. Pathogens which have been linked to manure applications include bacteria, such as *Listeria*, *Salmonella*, and *E. coli* 0157:H7, as well as parasites, such as roundworms and tapeworms.

Publicity about illnesses due to *E. coli* has made people much more aware of the potential risk of food borne illness from manure contamination of food. Due to increased awareness, many people are now asking about the safety of using manure on garden soil.

When fresh manure is used in a vegetable garden, there is a small risk that disease-causing pathogens may contaminate the vegetables. The risk of manure application is greatest for root crops like radishes and carrots, and for leafy vegetables, such as lettuce, where the edible part touches the soil. Careful washing and/or peeling will remove most of the pathogens responsible for disease. Thorough cooling is even more effective at killing pathogens on garden crops.

To reduce the risk of disease, we suggest taking these precautions:

1. Apply composted manure at least 60 days before harvesting any garden vegetables that will be eaten without cooking. The best procedure is to apply manure in the fall to allow breakdown of pathogens before the garden is planted in the spring.
2. Never apply manure after the garden is planted.
3. Thoroughly wash raw vegetables before eating.
4. Do not use cat, dog, or pig manures in gardens or compost piles, because parasites which can be in these manures may survive and remain a hazard to humans.
5. People who are especially susceptible to food borne illnesses should avoid eating uncooked vegetables from manured gardens. Those who face special risks from food borne illness include pregnant women, very young children, and those with chronic diseases such as cancer, kidney failure, chronic liver disease, diabetes, or AIDS.

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## ORGANIC AMENDMENTS AND FERTILIZERS

Animal manures vary in nutrient content and nutrient availability. Below is a selection of widely available organic amendments and fertilizers. In most cases, composted manure can be worked into the soil during tilling in either fall or spring. Fertilizers can be applied once or twice during the growing season for crops needing a nutrient boost or for new plantings. Unless otherwise noted, amendments that change pH should be used only as often as soil tests indicate. Verify all manure is at least one year out of the animal and not sourced from animals fed weed-free hay.

Name	Function	Application Rate	Comments
Blood Meal 15-3-0	Fertilizer. Provides nitrogen	2 lbs./100 sq ft	Also called dried blood meal. When using as a side dressing, keep 2-3" away from plant stems
Bone Meal 2-28-0	Fertilizer. Provides phosphorus, calcium	2 lbs./100 sq ft	Work into topsoil immediately after applying; the pungent odor may attract rodents.
Chicken Manure, Rotted	Amendment/fertilizer. Adds organic matter. Provides nitrogen, phosphorus, potassium. Can be high in salts.	1-inch layer	Work into topsoil in fall or compost before using. If well composted, apply 120 days before planting seeds, harvest or consumption.
Compost	Amendment, not a fertilizer. Loosens clay soils, binds sandy soils, increases water-holding capacity.	2-3 inch layer	Best all-purpose amendment. Adds organic matter. Provides nitrogen, phosphorus, potassium.
Cottonseed Meal	Fertilizer. Provides nitrogen, phosphorus, potassium	2.5 lbs./100 sq ft	May be contaminated by pesticides.
Cow Manure, rotted	Amendment/fertilizer. Adds organic matter. Provides nitrogen, phosphorus, potassium	1-2 inch layer	Work into topsoil in fall or compost before using.
Fish Emulsion 5-1-1	Fertilizer. Provides nitrogen	¼ oz./100 sq ft	Sold as concentrated liquid that is diluted for use. Can also be applied as a foliar spray
Fish Meal	Fertilizer. Provides nitrogen, phosphorus. Also called fish scrap, fish tankage.	2 lbs./100 sq ft	Apply just before planting or as a side dressing during the growing season.
Green Sand	Amendment/fertilizer. Slows soil compaction, loosens clay soils, increases water-holding capacity.	5 lbs./100 sq ft	Use in conjunction with organic matter to amend clay soil. Provides potassium, trace elements.
Gypsum	Amendment. Loosens clay soils, balances pH. Provides calcium, sulfur.	2 lbs./100 sq ft	Also called land plaster, sulfate of lime. Pellets easier to use than powder
Horse Manure, rotted 1.5-6-.9	Amendment/fertilizer. Adds organic matter. Provides nitrogen, phosphorus, potassium, trace elements.	1-2 inch layer	Work into topsoil in fall or compost before using.
Leaf Mold	Amendment/fertilizer. Builds up soil humus content quickly. Adds organic matter. Provides nitrogen, phosphorus, potassium.	2-inch layer	Also called woods-soil when sold commercially. Can also be used as a mulch.
Limestone	Amendment. Raises pH. Provides calcium, magnesium.	6 lbs/100 sq ft for clay 4 lbs/100 sq ft for loam 2 lbs/100 sq ft for sandy	Also called ground limestone, dolomitic limestone. Avoid hydrated lime or quicklime—they dissolve too quickly in the soil and burn plant roots and kill soil life.
Peat Moss	Amendment. Loosens clay soils, lowers pH, increases water-holding capacity.	1-2 inch layer	Also called sphagnum peat moss. Work into topsoil. Adds organic matter.
Rabbit Manure, fresh 11.7.10	Fertilizer. Four times more nutrients than cow or horse manure, twice as rich as chicken manure.	Incorporate into the compost pile or top dress.	
Rock Phosphate	Amendment/fertilizer. Raises pH. Provides phosphorus, trace elements.	2.5 lbs/100 sq ft	Most effective if applied to acid soils.
Sawdust	Amendment, not a fertilizer. Adds organic matter. Provides nitrogen, potassium.	1-inch layer	Apply only well-rotted sawdust to soil. Best if added to the compost pile.
Seaweed Meal	Fertilizer. Provides nitrogen, potassium, trace elements.	1 – 2 lbs/100 sq ft	Also called kelp meal. Apply in early spring and work into topsoil.
Straw	Amendment, not a fertilizer. Adds organic matter. Provides nitrogen, phosphorus, potassium	2 – 3 inch layer	Do not buy straw labeled "weed free" it has herbicide on it. Can also be applied as mulch, then turned under when it decays.
Sulfur	Amendment. Loosens clay soils, improves water-holding capacity, lowers pH.	Up to 1 lb/100 sq ft apply every 8 weeks	Also called soil sulfur. After working into topsoil, water thoroughly.
Wood Ashes, leached	Amendment/fertilizer. Raises pH. Provides potassium, calcium.	2 lbs/100 sq ft	Keep stored wood ashes dry to prevent nutrients from leaching out. When using as a side dressing, keep 2-3" away from plant stems.

