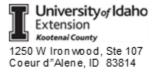
GUIDELINES FOR USING MANURE ON VEGETABLE GARDENS



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

