

NITROGEN-PHOSPHORUS-POTASSIUM VALUES OF ORGANIC FERTILIZERS

Organic fertilizers are used to improve soil quality and tilth, and to provide nutrients for plant growth. They provide nitrogen, phosphorus, and potassium, as well as other elements essential for plant development and overall good health.

Nutrient values vary greatly among organic fertilizers. They also vary greatly for a **given** organic fertilizer. For example, as the table on the following three pages shows, the nitrogen in raw bone meal ranges from 2 to 6%, and the phosphorus from 15 to 27%. Differences reflect variations in the age of organic material, its decomposition rate, application method and timing, incorporation time, time exposed to the elements (rain, sun), the percentages of organic matter and water the material contains, carbon-to-nitrogen ratio, microbe population, and soil type. Values for manures vary according to time of year, time in the open air, percentage of added straw, and rate of incorporation. The speed of release shown in the table indicates how quickly nutrients are made available to plants.

Some materials are regulated by Oregon Tilth. To be considered organic, they must result from organic farming methods. For example, cocoa shell meal and cottonseed meal must not be contaminated with pesticide residues. Raw manure is also regulated; composted manure is not. Wood ashes must not be from treated wood.

Nitrogen, phosphorus, and potassium are represented by N, P, and K in the table headings, to conform to standard commercial practice in labeling fertilizers. Phosphorus is actually present in the form of P_2O_5 , potassium as K_2O .

Top Sources of Nitrogen, Phosphorus, and Potassium

Nitrogen (N)

bat guano
blood/blood meal
crab waste
feather meal
fish meal (dry)
hair
hoof/horn meal
shrimp waste

Phosphorus (P)

bat guano
bone meal
crab waste
cucumber skins (burned)
hair
mushroom compost
phosphate
shrimp waste

Potassium (K)

crab waste
cucumber skins (burned)
granite (dust)
greensand
kaolinite (clay)
kelp
sulfate of potash magnesia
wood ashes

Material	%N	%P	%K	Release Speed	Effectiveness	Comments
Alfalfa	2.5	0.5	2	Slow	2 to 6 months	Cover crop
Animal Tankage (dry)	7	10	0.5	Medium		
Bat Guano	5.5 to 8	4 to 8.6	1.5	Medium to fast		
Bat Guano (Peruvian)	12.3	8 to 11	2.5	Medium		
Blood (dried)	12	1.5	0.6	Medium to fast		
Blood Meal	12.5	1.5	0.6	Medium	6 to 8 weeks	
Bone Meal (raw)	2 to 6	15 to 27	0	Slow to medium	6 weeks	Can burn plants.
Bone Meal (steamed)	0.7 to 7	18 to 24	0	Slow to medium	2 to 4 months	
Castor Pomace	5	1.8	1	Slow		
Clover, Crimson	2	0.5	2	Slow	2 to 6 months	Cover crop
Cocoa Shell Meal	2.5	1	2.5	Slow		
Compost	1.5 to 3.5	0.5 to 1	1 to 2	Slow		
Cottonseed Meal (dry)	4 to 6	2.5 to 3	1.6	Slow to medium	4 to 6 months	Acidic
Crab Meal	10	0.25	0.05	Slow	4 to 6 months	
Crab Waste	30	21	5.5			
Cucumber Skins (burned)	0	11	27	Fast		
Eggshells (burned)	0	0.5	0.3	Fast		
Feather Meal	15	0	0	Slow	4 to 6 months	Best if ground up.
Fish Emulsion	5	1	1	Fast	2 weeks	Spray foliage or apply dilute solution to soil.
Fish Meal (dry)	10	4 to 6	0	Medium	4 to 6 months	

Material	%N	%P	%K	Release Speed	Effectiveness	Comments
Fish Scrap (dry)	3.5 to 12	1 to 12	1 to 1.5	Slow		Bury deep; attracts 4-legged pests.
Granite (dust)	0	0	3 to 6	Very slow	3 to 5+ years	
Greensand	0	1.5	5	Very slow	5+ years	Improves water retention.
Hair	12	26	0	Very slow	4 to 12 months	
Hoof/Horn Meal	9 to 14	1.5 to 2	0			
Kaolinite (clay)	0	0	12	Medium		
Kelp	1	0.5	4 to 13	Slow	4 to 6 months	Contains potassium chloride, sodium carbonates, sodium sulfates, potassium sulfates.
<u>Manure (fresh)</u>						
Cattle	0.5 to 1.5	0.2 to 0.7	0.5 to 2	Medium	2 years	
Cattle (dairy)	0.5 to 2	0.3 to 0.5	0.4 to 1.5	Medium	2 years	
Duck	2.6	0.8 to 1.4	0			
Goat	4	0.6	1 to 2.8	Medium		Concentrated; compost
first.						
Goose	3.3	0.4	0.6	Medium		Concentrated; compost
first.						
Horse	0.7 to 1.5	0.2 to 0.7	0.6 to 0.8	Medium	2 years	
Pig	0.4 to 2	0.5 to 1	0.4 to 1.2			
Pigeon	6.3 to 6.5	2.5	2.5			
Poultry (75% water)	1.5	1	0.5			
Poultry (50% water)	1.5 to 2	1.8 to 2.1		Medium to fast		
Poultry (30% water)	3 to 4	2.5	1.5	Medium to fast	2 years	Best when composted.
Poultry (15% water)	6	4	3	Medium to fast	2 years	
Rabbit	3 to 4.8	1.5 to 2.8	1 to 1.3	Medium		
Sheep	2.2 to 3.6	0.3 to 0.6	0.7 to 1.7	Medium		
Turkey	5	0.5	0.6 to 0.9	Medium to fast		
Marl	0	2	4.5	Very slow		
Mushroom Compost	0.5 to 0.8	40 to 55	0.5 to 0.8	Slow		Often has high salt content.
Peas, Austrian Winter	2 to 3	0	1	Slow	2 to 6 months	Cover crop
Peat and Muck	1.5 to 3	0.25 to 0.5	0.5 to 1	Very slow		

Material	%N	%P	%K	Release Speed	Effectiveness	Comments
Phosphate, Colloidal	0	17 to 25	0	Slow	3 years	
Phosphate, Rock	0	17 to 30	0	Very slow	5+ years	
Rye, Annual	1	0	1	Slow	2 to 6 months	Cover crop
Sawdust	0.1	0.05 to 0.1	2 to 4	Very slow	2 to 4 years	Causes nitrogen deficiency.
Seaweed	0 to 2	0	0.5 to 1	Fast		Foliar spray
Shrimp Shells	1.3	1.0	0			
Shrimp Waste	25	20	1			
Sodium Nitrate	16	0	0	Fast		Restricted to no more than 20% of crops total N requirement.
Soybean Meal (dry)	6.5	1.5	2.4	Slow to medium		
Sulfate of potash magnesia	0	0	22			22% sulfur, 11% magnesium
Urine soaked bedding	36 to 42	0	0	Fast		
Wine Grape Compost	1.5	2.0	0.5			
Wood Ashes	0	5	3 to 7	Fast	1 to 4 months	Alkaline; contains 32% CaCO ³ . Fireplace ashes may contain toxic metals.
Wool Wastes	5 to 6	2 to 4	1 to 3	Very slow	4 to 9 months	May mat into layers.
Worm Castings	1.5	2.5	1.3			

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