



# HEALTHY SOIL...HEALTHY PLANTS

The key to successful gardening is “healthy soil.” This basic principle of organic gardening applies to all plants. Quite simply, when you feed the soil the proper nutrients, you let the soil feed the plants. So how do you “feed” the soil? First, you need to understand some basic principles about soil and why it is so important, then you can take steps to improve it.

To start, you should determine the soil texture by moistening the soil and rubbing it between your thumb and fingers to determine it’s “feel.” Sands are gritty and will barely hold together; clay can be squeezed into a firm shape; and silt will act in a way to allow particles to cling

together. Sandy soils tend to dry out quickly because they contain high amounts of soil air. Oppositely, clay soils have a tendency to pack together, shutting out air and water. The best garden soil, “loam,” has moderate amounts of sand, silt and clay. Generally, soil in our area tends to be clayey. This condition can be improved by adding *Profile Soil Conditioner* (kiln fired mineral blend), *Gypsum* or *Permatill* (slate particles). For sandy soils, humus should be added to help retain moisture and nutrients.

Next, you must evaluate the soil structure. Soil structure is affected by soil pH, the amount of humus and the combination of minerals in the

## ORGANIC FERTILIZERS

Amendment	Benefit	Avg N-P-K Ratio	Avg Appl. Rate Per 1,000 Sq. Ft. (based on present soil fertility)	
Alfalfa Meal	Organic Matter	5-1-2	Low: 50 lb.	Adq: 25 lb.
Blood Meal	Nitrogen	12-0-0	Low: 30 lb.	Adq: 10 lb.
Bonemeal	Phosphate	4-12-0	Low: 30 lb.	Adq: 10 lb.
Cottonseed Meal	Nitrogen	6-2-1	Low: 35 lb.	Adq: 10 lb.
Epsom Salts	Balancer, Magnesium	10% Magnesium, 13% Sulfur	Low: 5 lb.	Adq: 1 lb.
Fish Emulsion	Nitrogen	4-1-1, 5% Sulfur	Low: 2 oz.	Adq: 1 oz.
Greensand	Potash	7% Potash, 32 Trace Minerals	Low: 100 lb.	Adq: 25 lb.
Gypsum	Balancer, Calcium	22% Calcium, 17% Sulfur	Low: 40 lb.	Adq: 5 lb.
Kelp Meal	Potash, Trace Minerals	1-0.5-2.5	Low: 20 lb.	Adq: 5 lb.
Limestone	Balancer, Calcium, Magnesium	51% Calcium Carbonate, 40% Magnesium Carbonate	Low: 100 lb.	Adq: 25 lb.
Mushroom Compost	Organic Matter	Variable	Low: 350 lb.	Adq: 50 lb.
Peat Moss	Organic Matter	pH Range 3.0 -4.5	As Needed	
Rock Phosphate	Phosphate	0-3-0, 32% Phosphate, 32% Calcium	Low: 60 lb.	Adq: 10 lb.
Worm Castings	Organic Matter	0.5-0.5-0.3	Low: 250 lb.	Adq: 50 lb.

### KEY WORDS

Soil Texture - The proportional amount of sand, silt and clay in the soil.

Soil Structure - The arrangement of soil particles in the soil.

Soil pH - The measurement of acidity or alkalinity of the soil.

Organic Matter - Various forms of living and dead plant and animal matter.

soil. Ideal soils allow soil particles to clump together with air spaces between them for water drainage as well as oxygen consumption and carbon dioxide release from plant roots. The best way to improve soil structure is to add high amounts of organic matter like humus, dehydrated manure, composted manure, mushroom compost, alfalfa meal, peat moss, or worm castings.

You will also need to take a soil sample, to measure the pH and amounts of nitrogen, phosphorus and potassium in the soil as well as other nutrients. This will help determine exactly what the soil needs. At Primex, we offer *Penn State Soil Tests* that take 2-3 weeks to get a detailed analysis. Our staff will help you read the results and determine what to add to your soil and how much. Generally, a pH of 6.0 to 7.0 is

acceptable. If your pH is lower than this, your soil is too acidic and requires lime to be added. If your soil is low in organic matter, it will often have a high pH level. All plants require a proper balance of nutrients - nitrogen (N), phosphorus (P) and potassium (K). Soils lacking any one of these elements will not produce healthy plants. Refer to the Organic Fertilizer Chart for suggested amendments.

When dealing with poor, or improperly balanced soils, obtaining "healthy" soil may take two to five years to acquire. The best thing you can do to supplement your soil program is to use various organic fertilizers to meet your plants' needs and regularly add organic matter. This will continue to help the soil structure as well as create biological activity that is also a vital part to developing productive soil.