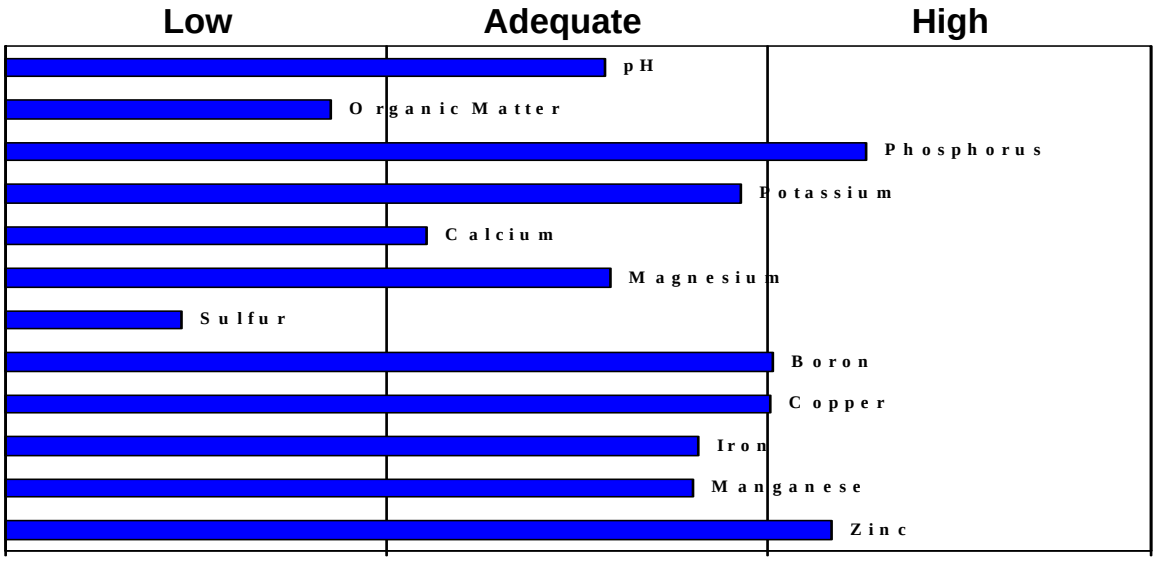
# Testing For Healthy Soil

*www.drgoodearth.com*

**P.O. Box 50084, St. Louis, MO 63105**

**Phone: 314-994-2167 Fax: 314-994-2167**

| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crops:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |




| Test | Test Value | Recommendation |
|---|---|---|
| *pH* | *6.7* | *No Adjustment Necessary* |
| *Organic Matter* | *1.7%* | *Add 2" compost/peat moss & incorporate* |
| *Phosphorus* | *8.1 lbs/1000 sq ft* | *No Adjustment Necessary* |
| *Potassium* | *12.2 lbs/1000 sq ft* | *No Adjustment Necessary* |
| *Calcium* | *70.2 lbs/1000 sq ft* | *No Adjustment Necessary CEC = 10.0* |
| *Magnesium* | *9.4 lbs/1000 sq ft* | *No Adjustment Necessary* |
| *Sulfur* | *0.2 lbs/1000 sq ft* | *Apply 1/4 lb gypsum/100 sq ft* |
| *Zinc* | *8.4 oz/1000 sq ft* | *No Adjustment Necessary* |
| *Iron* | *2.2 lbs/1000 sq ft* | *No Adjustment Necessary* |
| *Manganese* | *8.8 oz/1000 sq ft* | *No Adjustment Necessary* |
| *Copper* | *0.9 oz/1000 sq ft* | *No Adjustment Necessary* |
| *Boron* | *1.1 oz/1000 sq ft* | *No Adjustment Necessary* |

# Testing For Healthy Soil

*www.drgoodearth.com*

**P.O. Box 50084, St. Louis, MO 63105**

**Phone: 314-994-2167 Fax: 314-994-2167**


| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crops:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |

To correct your soil deficiency, select a brand of fertilizer in the table below and apply the amount stated by weight, cups or tablespoons per given area

| | | | Amt to Apply/100 sq ft | | |
|---|---|---|---|---|---|
| **Deficiency** | **Fertilizer** | **% Product** | **Weight or Cups or Tbsp** | | |
| Nitrogen | Scotts Starter Fertilizer (20-27-5) | 20% | 1.5 lbs | 3.50 | 58 |
| | Peters All Purpose Fertilizer (20-20-20) | 20% | 1.5 lbs | 3.50 | 58 |
| | Miracle-Gro Tomato Food (18-18-21) | 18% | 1.5 lbs | 4.00 | 62 |
| | Miracle-Gro Rose Food (18-24-16) | 18% | 1.5 lbs | 4.00 | 62 |
| | Osmocote Indoor/Outdoor Slow Release (19-6-12) | 19% | 1.5 lbs | 3.50 | 59 |
| | Osmocote Veg.& Bedding Plant Food (14-14-14) | 14% | 2.0 lbs | 5.00 | 80 |
| | Miracle-Gro All Purpose Fertilizer (15-30-15) | 15% | 2.0 lbs | 4.50 | 74 |
| | Vigoro Blood Meal Organic (12-0-0) | 12% | 2.5 lbs | 6.00 | 96 |
| | Vigoro Bone Meal Organic (1-11-0) | 1% | 30 lbs | 72.0 | 1152 |
| | Milorganite Organic Slow release (6-2-0) | 6% | 5.0 lbs | 12.0 | 192 |
| | Fertilome Rose Food (14-12-11) | 14% | 2.0 lbs | 5.00 | 82 |
| | Fertilome Tree & Shrub Food (19-8-10) + 1% Iron | 19% | 1.5 lbs | 4.00 | 61 |
| | Hi-Yield Ammonium Sulfate (21-0-0) | 21% | 1.5 lbs | 3.50 | 55 |
| | Urea (45-0-0) | 45% | 0.5 lbs | 1.50 | 26 |
| | Blood Meal 14-0-0 (organic nitrogen) | 14% | 2.0 lbs | 5.00 | 82 |
| Sulfur | Hi-Yield Sulfur (granular) | 90% | 4 oz | 0.75 | 11 |
| | Hi-Yield Gypsum (granular) | 23% | 1.0 lbs | 1.50 | 26 |
| | Pelletized Sulfur Sulfur (pellet) | 98% | 4 oz | 0.25 | 5 |
| | Pelletized Gypsum Gypsum (pellet) | 20% | 1.5 lbs | 2.50 | 40 |
| | Magnesium Sulfate Epsom Salts | 22% | 1.0 lbs | 2.00 | 32 |
| | Sulfate of Potash - Magnesia Sul-Po-Mag (organic) | 22% | 1.0 lbs | 11.0 | 182 |

# Testing For Healthy Soil

*www.drgoodearth.com*

**P.O. Box 50084, St. Louis, MO 63105**

**Phone: 314-994-2167 Fax: 314-994-2167**


| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crops:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |

COMMENTS (Low Sulfur): This soil sample was found to be deficient in sulfur and would benefit from the addition of gypsum (calcium sulfate) at the rate specified. This can be applied now as a surface application or incorporated into the top three to six inches of soil by tilling or following core aeration in the case of lawns. A single application is all that is probably necessary unless this soil is highly porous or sandy in nature. Repeat application may be necessary and retesting is recommended in one year.

## Fertilizer Recommendations

VEGETABLES (GENERAL): The timing and rate of nitrogen fertilizer application will depend upon the type of vegetable crop/plant being grown, the stage of development and soil type. Prior to planting in the spring, as a general nitrogen recommendation for all annual vegetable crops/plants, apply 3 pounds of actual nitrogen per 1,000 sq. ft. and till into the soil. This is equal to spreading 30 pounds of a fertilizer with 10% nitrogen (10-0-0) over an area measuring 1,000 sq. ft. This recommendation is for nitrogen only. Any other nutrient deficiencies as determined through soil testing should be addressed separately. Additional fertiliziers might be recommended to correct these deficiencies at the same time. Periodic nitrogen applications during the growing season will be necessary again, depending upon the plant being grown. Keep in mind that sandy and well-drained soils should be fertilized more often with diluted concentrations for the best growth response.

FRUITING VEGETABLES (Tomatoes, Peppers, Eggplant , Cucumbers, Squash, Beans, etc.): For all seeded and transplanted vegetables, in 4 to 6 weeks after planting or when plants are half grown or just after the fruit is set, apply nitrogen fertilizers in the amounts shown in the table above for the area given. Repeat this application 3 and 6 weeks later for tomatoes. Work the fertilizer into the soil with a hoe or cultivator. Be sure to wash granular fertilizers off of the foliage to prevent burning.

LEAFY VEGETABLES AND ROOT CROPS (Lettuce, Spinach, Carrots, Beets, etc.): For all seeded and transplanted vegetables, when plants are half grown, broadcast the nitrogen fertilizer amounts given in the table above or side-dress (apply a band of fertilizer along one side of the row 6 to 10 inches away from the plant row). Lightly work this into the soil with a hoe or cultivator.

PERENNIAL VEGETABLES: Perennial vegetables like asparagus and rhubarb require timely applications of nitrogen fertilizers to maintain plant vigor and growth throughout the season. This builds nutrient reserves in the root system and consistent production of produce.

ASPARAGUS: Before the crop emerges in the spring or after the final harvest, broadcast 1 to 1.5 pounds of actual nitrogen per 1,000 sq. ft.

RHUBARB: When the plants are less than 6 inches tall, apply 1.5 pounds of actual nitrogen per 1,000 sq. ft.

## General Explanation

SOIL pH: The expressed measure of soil acidity is called pH. Values range between 1.0 (acid) to 14.0 (alkaline) with a pH of 7.0 being neutral. Most ornamental plants including annuals, perennials as well as lawns, vegetables, trees, shrubs, small

# Testing For Healthy Soil

*www.drgoodearth.com*

**P.O. Box 50084, St. Louis, MO 63105**

**Phone: 314-994-2167 Fax: 314-994-2167**


| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crops:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |

fruit and fruit trees will do well in the pH range of 6.3 to 7.0. Plants that grow well in acidic soils like blueberries, potatoes, azalea, rhododendron, holly, pine and spruce, require a pH in the range of 5.0 to 5.9. Test results of this sample indicate that the pH is satisfactory for the crop/plant you wish to grow and therefore, no adjustment is necessary.

ORGANIC MATTER: Garden soils with less than 5% organic material will benefit from additions of compost, leaf mold, peat moss or other organic material applied to the surface as a mulch or worked into the soil before planting. To incorporate, add about 4 bushels of organic matter per 100 sq. ft. or spread a 2-inch layer over the surface before turning the soil. When amending soils with sawdust, straw or wood chips, add nitrogen fertilizer at the rate of one-half pound of nitrogen per 1,000 sq. ft. of planting area to prevent plants from becoming nitrogen deficient. As an example using a general garden fertilizer like 10-10-10, spread 5 pounds over 1000 sq. ft. This amount is equal to one-half pound of actual nitrogen (10% of 5 pounds). For existing lawns, a light application of organic matter like compost can be surface applied or top dressed over the area. When possible, core aerate the lawn extensively prior to application. For native wildflower gardens, only sparing amounts of organic matter should be applied. An over-application may cause excessive growth and lodging. One-half inch deep layer around the plant should be sufficient.

NITROGEN: Good plant growth depends upon a sufficient supply of nitrogen in the soil for uptake. Since it leaches from the soil and is used by other soil organisms, it needs to be applied each growing season. The amount of nitrogen fertilizer to be applied depends upon the plant or crop being grown. Vegetables require more nitrogen than shade trees and shrubs because they are growing fast and fruit production is the goal. Too much nitrogen can cause excessive, "leafy"growth, slow fruit development and possibly burn plants. Inorganic sources of nitrogen are typically soluble in water and have a higher potential for leaf burn, if not applied correctly or in the right amounts. Inorganic forms of nitrogen include ammonium nitrate (33% nitrogen), calcium nitrate (15%), sodium nitrate (16%), urea (46%) and potassium nitrate (12%). Organic forms of nitrogen require the action of soil microbs to make nitrogen available for plant uptake. Therefore, the process takes time and generally these fertilizers are less apt to burn plants. Sources of organic nitrogen include dried blood (12% nitrogen), hoof and horn meal (12%), fish meal (8%), cottonseed meal (7%), and livestock/poultry manure (2 to 4%).

PHOSPHORUS: Adequate levels of phosphorus for most plants and crops should be in the range of 2 to 4 pounds per 1,000 sq. ft. Higher levels will not damage the crop/plant, but may overload the soil with unnecessary nutrients. When applied as a fertilizer, phosphorus will stay in the soil for long periods. The availability of phosphorus to plant roots is dependent upon pH and soil temperature. Cold soils and a pH range below 5.0 or above 7.5 make phosphorus less available for root uptake. Inorganic sources of phosphorus include superphosphate (20% phosphorus) and treble superphosphate (45%). Organic forms of phosphorus include bone meal (12%), fish meal (6 to 7%), cottonseed meal (2%) and poultry manure (2 to 4%).

POTASSIUM: Adequate levels of potassium for most plants and crops should be in the range of 6 to 12 pounds per 1,000 sq. ft. Levels greater than 25 pounds per 1,000 sq. ft. can burn plants. Care should be taken in applying potassium fertilizers so that amounts do not cause leaf burn. Where indicated, follow the directions to split applications so that half is applied now and half in 4 to 6 weeks during the growing season. Always incorporate by tilling when possible. After the growing season, applications of potassium can be increased without the threat of burning plants. Inorganic sources of potassium include potassium chloride which is also called muriate of potash (60% potassium), potassium nitrate (44%) and potassium sulfate (48%). Organic sources include wood ashes (5%:- use at the rate of 2.5 lbs per 100 sq. ft. and check the pH to ensure that it remains under 6.5), greensand (6%), seaweed or kelp (1 to 5%) and cottonseed meal (1 to 2%).

CALCIUM - MAGNESIUM: Both calcium and magnesium are important for building strong cell walls, photosynthesis and

# Testing For Healthy Soil

*www.drgoodearth.com*

**P.O. Box 50084, St. Louis, MO 63105**

**Phone: 314-994-2167 Fax: 314-994-2167**


| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crops:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |

activation of enzymes in plant cells. It is uncommon for either nutrient to be deficient in soils. However, their relative amounts are good indicatiors of a soil's ability to supply nutrients to plant roots for uptake. Calcium is added to soil in the form of limestone or gypsum (calcium sulfate). Limestone will change the pH of the soil from acid to alkaline and should only be applied when the soil pH is too acid for good plant growth. If the pH is adequate and calcium levels are low, gypsum should be added to increase the amount of calcium in the soil. Additions of gypsum will not affect the soil pH. Magnesium can be supplied in the form of epsom salts (magnesium sulfate).

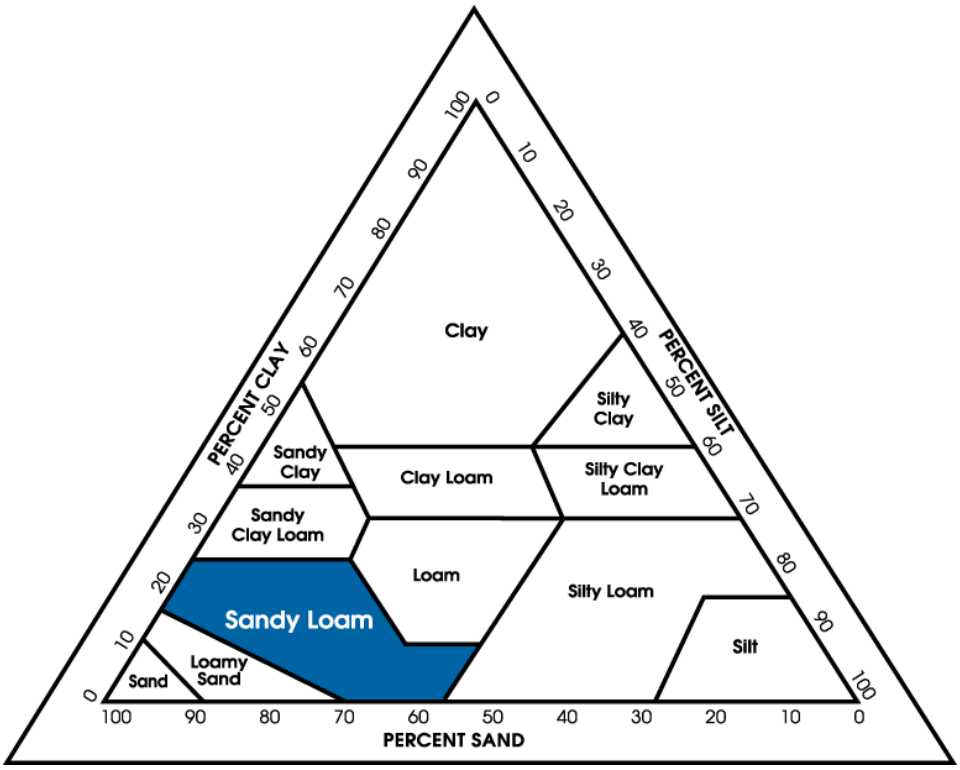
MICRONUTRIENTS: Sulfur, iron, zinc, manganese, copper and boron are considered to be secondary or micronutrients since they are present in small amounts both in the soil and plant. Nevertheless, these nutrients are essential to good growth and occassionally are not present either in sufficient quantities or are unavailable for uptake due to extremes in soil acidity or alkalinity. With the exception of sulfur and iron, it is easiest to correct a micronutrient deficiency by applying a commercial micronutrient fertilizer mix. This mix generally consists of some or all of the essential micronutrients for plant growth. Organic sources of micronutrients include seaweed and fish fertilizers.

Sulfur can be purchased as a dust or pelleted form. The pelleted form is easy to work with and should be incorporated into the soil ( 1 to 3 inches) to gain the quickest response. Iron is available as iron sulfate otherwise called copperas, cheleated iron or other forms. Organic sources of iron include greensand, seaweed and fish emulsion. Since pH of the soil can limit the availability of micronutrients to plant roots, it is always best to check the soil pH and correct this at the same time that a new supply of micronutrients is applied.

# Testing For Healthy Soil

www.drgoodearth.com
P.O. Box 50084, St. Louis, MO 63105
Phone: 314-994-2167 Fax: 314-994-2167

| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crop/Plant:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |




## Soil Classification: Sandy Loam

68 % Sand 23 % Silt 10 % Clay

Soils are composed of particles with infinite sizes and shapes. On the basis of size alone, soils are made up sand, silt and clay. Each one contributes to the physical characteristics of a soil and influences the chemical and physical reactions that affect plant growth. The smallest of these particles is clay which stores the greatest amount of nutrients for plant growth. The largest is sand which promotes air and water exchange. There are twelve basic soil textural classes shown in the triangle above representing different compositions of sand, silt and clay.

Sandy loam soils have a significant amount of fine sand and small, roughly equal amounts of clay and silt. A sandy loam would feel somewhat gritty when it was pressed between the fingers. Sandy soils are well-drained, but poorer at holding

# Testing For Healthy Soil

*www.drgoodearth.com*

**P.O. Box 50084, St. Louis, MO 63105**

**Phone: 314-994-2167 Fax: 314-994-2167**


| | | |
|---|---|---|
| **Gardener:** Veronica Tegen | **Dealer** | **Report Date:** April 28, 2011 |
| 2101 Carlmont Dr #207 | EarthCo | **Lab #** 256347 |
| Belmont, CA 94002 | P.O. Box 50084 | **Crop/Plant:** Vegetable Garden |
| 803-984-7248 | St. Louis, MO 63105 | **Sample ID:** Raised Bed Veg Garden |

nutrients and water. However, they are easy to work. Fertilizers should be applied more frequently, but in smaller amounts since sandy loam soils do not have a very high capacity to hold nutrients. To improve these soils in flower and vegetable gardens, incorporate organic matter annually by applying 2 to 4 inches of leaf mold, compost or peat moss over the top and till to a depth of 6 to 8 inches. For newly seeded/sodded lawns, add the same amount over the top and till to a depth of 3 to 6 inches. Perennials gardens, trees and shrubs will benefit from additions of organic matter as a surface mulch. One to two inches spread over the root zone each year will benefit these plantings. Additions of organic matter will increase moisture holding capacity, ability to retain nutrients and improve soil structure or clodding. Overall, sandy loams can be one of the most productive soils for plant growth.