

What does fertilization mean to roses?

Aka, what can I use to grow a healthy garden of roses and maybe even a “Queen” for the rose show?

By Constance Vierbicky, MCR

A brief description of how your rose bush makes food:

Your rose bush takes in carbon dioxide from the air, water and nutrients from the ground and makes sugars and starches (the source of energy to do that is sunlight and the reaction is known as photosynthesis). These building blocks in rose plants are technically known as carbohydrates (carbon and water). The plant uses this to grow healthy stems, leaves and make beautiful roses. The plant does not need the oxygen left over from the carbon dioxide so the plant releases oxygen back to the atmosphere. Carbon dioxide + water + energy = sugar + oxygen.

Fertilize means to make productive: A bag of fertilizer has three main numbers: Ex: 20-10-30. The individual numbers represent the % of Nitrogen, Phosphorous and Potassium in the overall bag. The rest of the ingredients in the bag may be Dolomite, Gypsum or Limestone etc.

Roses need:

3 Primary Elements (Macronutrients): Nitrogen, Phosphorous and Potassium

- A) **Nitrogen (N):** contributes to making the plants have tall, strong canes, good blooms and green leaves. Deficiencies show in older leaves, light foliage beginning at the bottom of the plant and veins of leaves are yellow. Inorganic Forms: water-soluble nitrate. Organic Forms: Alfalfa Meal, Fish Emulsion, Sewage Sludge, Blood meal. Be careful not to apply too much nitrogen during a growing season as the rose blooms get vegetative centers (looks like the Green Rose growing in the middle of your bloom). Nitrogen leaches *easily* from soil with too much rain; mostly available below 5.5 pH and above 7.5 pH. Lack of oxygen in soil after heavy rains can mimic nitrogen deficiency.
- B) **Phosphorus (P):** stimulates root growth, big bloom production and hastens plant maturity adding to winter hardiness. Deficiency appears in older foliage developing dark red and purple colors. Phosphorous moves *slowly* through the soil. I recommend adding one half cup of super phosphate to the planting hole each time you plant a rosebush. It becomes less available when pH drops below 6 or above 7.5. Inorganic forms are found in superphosphate. Organic forms are found in fishmeal, Sewage Sludge and Bone meal.
- C) **Potassium (K):** contributes to the vigor in root and cane production; high turgidity in bloom and foliage; need this element for starch formation; works to balance surplus of other two primary elements. **Potassium** deficiency usually is seen in older foliage. Leaf margins are brown, weak stems and many blind shoots. Potassium leaches *easily* from the soil and becomes unavailable to plant below 6.0. Inorganic forms: SulPoMag (SPM) Nitrate of potash (avoid using muriate of potash) Organic forms: kelp, seaweed, composted manures.

Roses need:**3 Secondary Elements (Macronutrients): Calcium, Magnesium and Sulfur**

- A) **Calcium (Ca):** Increases cell wall growth; reduces dieback; improves vigor and strength of plant; neutralizes harmful acids; improves soil and leaches salts. **Calcium** deficiencies appear at new growing tips-brown edges appear. Highest availability in pH range of 6.5-7.5 Inorganic forms: Dolomite, gypsum, rock phosphate. Organic forms: Bone meal, manures. Be aware of large amounts of fresh manures applied to plants as it may burn plants. Also, bacteria level is very high in manures so **rosarians MUST get a tetanus shot every ten years.**
- B) **Magnesium (Mg):** Promotes chlorophyll production, which makes foliage green and healthy, promotes disease resistant plants; increases basal break development. Magnesium deficiency will be shown in older leaves yellowing, starting from center of leaf with signs of dying tissue overlaying the affected parts; With a high rainfall, magnesium leaches from soil; highest availability in pH range of 6.5-7.5. Inorganic forms: Epsom salts, SulPoMag, Dolomite lime. Organic Forms: manures, composts.
- C) **Sulfur (S):** Essential to root growth; key element of several important amino acids, lowers pH. Sulfur deficiency shows when veins of older leaves become pale; available in pH range of 6.5-7.5. Inorganic Forms: Epsom salts, gypsum, SulPoMag. Organic Forms: manures, composts.

Roses need:**6 Trace Elements (Micronutrients): Iron, Manganese, Boron, Zinc, Copper and Molybdenum. Very, very small amount of these elements needed.**

- A) **Iron (Fe):** Essential in production of chlorophyll for green foliage. Regulates respiration of oxygen and sugar burning enzymes. Deficiency shows in young leaves at top of bush (chlorosis), leaves yellow, veins are green. Readily available at less than 6.5 pH. Inorganic forms: Chelated Iron (Sequestrene). Organic forms: manures and meals that covert to usable form in acidic soil.
- B) **Manganese (Mn):** Enzyme activity for photosynthesis, used in respiration and nitrogen metabolism. Deficiency in young leaves, brown, black spots next to veins. Available at less than a 6.5 pH. Inorganic forms: Essential minor elements; Manganese sulfate. Organic forms: Sewage sludge, manures and meals
- C) **Boron (B):** Controls starch formation, stimulates cell division and flower formation. Deficiency shows in terminal bud dying and young leaves curling. Available at less than 6.5 pH. Inorganic Forms: Essential minor elements and in "20 mule team borax". Organic forms: trace amounts in manures, meals
- D) **Zinc (Zn):** Stimulates stem growth and flower bud formation. Deficiency shows in mature mottled leaves, irregular yellow areas available at less than 7.0 pH. Inorganic forms: Essential minor elements, Zinc sulfate. Organic Forms: trace amounts in soil, manures and meals
- E) **Copper (Cu):** Stimulates stem development and pigment, enzyme activator. Deficiency is seen when young leaves get light edges with some brown spots. Available below 7.0 pH. Inorganic forms: Essential minor elements, Copper Sulfate. Organic forms: trace amounts in soil, manures and meals.
- F) **Molybdenum (Mo):** Needed to make amino acids to stimulate plant growth and for nitrogen fixation. Deficiency shows in pale mature leaves with rolled margins. Available when pH is greater than 6.5. Inorganic forms: Essential minor elements. Organic forms: trace amounts in soil, sewage sludge.

The following is a condensed version of the 12 elements rosebushes need and their deficiencies:

Element	Leaves to first show deficiency	Symptom
Nitrogen	Old	Pale green leaves and yellow veins
Phosphorus	Old	Purplish tints on underside of leaf
Potassium	Old	Yellow areas, then browning of leaf edges and tips
Magnesium	Old	Yellow spots with dead centers
Sulfur	New	Similar to nitrogen deficiency
Calcium	New	Damage and die off of growing points; yellowish leaf edges
Manganese	New	Dead yellowish tissue between leaf nerves
Copper	New	Dead leaf tips and withered edges
Zinc	Old	Yellowish areas between nerves starting at leaf tip and edges
Boron	New	Dead shoot tips, new side shoots also die
Molybdenum	Old	Yellow spots between leaf nerves, then brownish areas along edges. Inhibited flowering
Iron	New	Yellow leaves, dark veins

The following chart shows the optimum availability of each element in the roses preferred range of 6.0 to 6.5.

**pH
Versus
Nutrient
Availability
Chart**

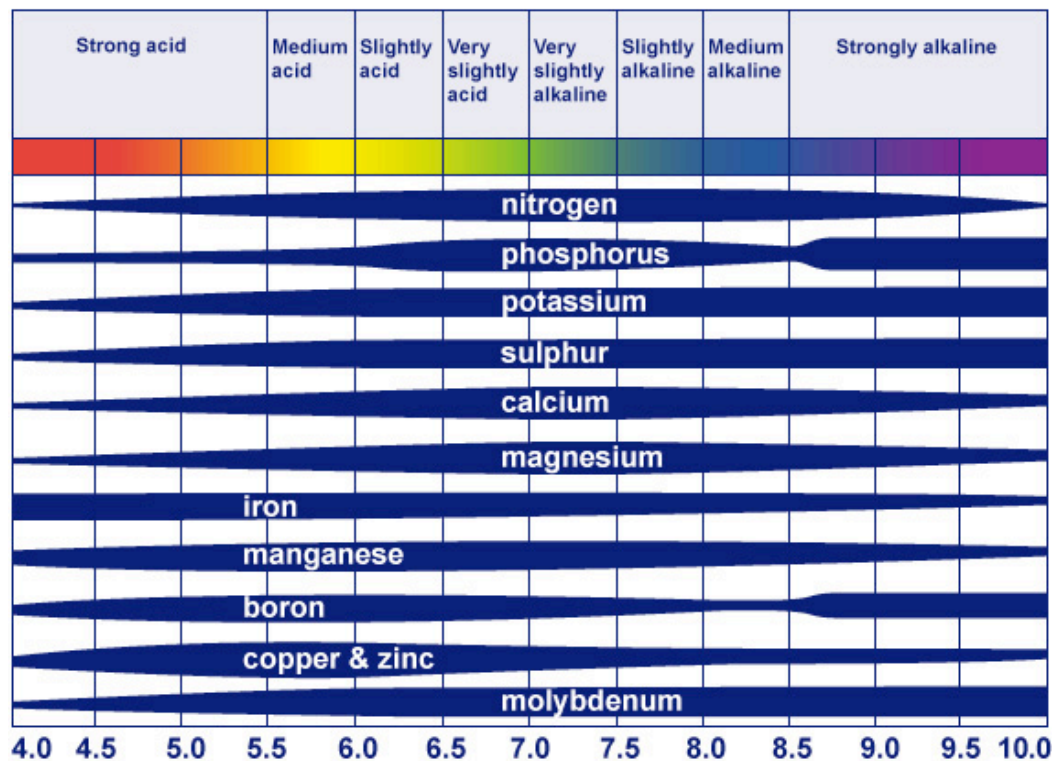


Chart courtesy <http://www.growing-life.com>

Where can I Get a pH Test?

A complete S 7 soil test with recommendations is \$28.50. Less complete, less expensive tests are available, but most rose growers around the country get the S7. Get a garden trowel and a clean bucket, plastic. Take 6-10 subsamples from around the garden. Put each in the bucket. Mix em all up good, and about a coffee cup full to: A&L Labs 1199 West Newport Center Drive Deerfield Beach, Fl 33442 954 571-2103.

pH measures the acidity in the soil. Your rosebush will absorb most nutrients within the pH range of 6.0 and 6.5 so it is important that you know the pH of your soil and how to adjust it. Dolomite lime, when applied, raises the pH of your soil in about two months. Sulfur, when applied, lowers the pH of your soil. See a Consulting Rosarian for recommended amounts per bush. Amounts and frequency of product applied depends on your soil analysis, which should be done every year by a local nursery or the extension center.

Types of Fertilizers

Organic Fertilizer Manufacturer



Chemical Fertilizers = synthetically produced. All chemical fertilizers are salts. All salts interfere with the ability of the plant to obtain water. Heavy applications of chemical fertilizers will cause burn on the leaves similar to not watering plant during hot weather. **NEVER APPLY FERTILIZER TO DRY SOIL.** Roses should always be watered before and after an application of chemical fertilizer. The existing salt level in the soil can also contribute to the burning effects to plants of adding chemical fertilizers.

Organic Fertilizers = come from once living organisms, low in nutrient content and are slow release requiring biological action from the soil to release the nutrients. This feeds the soil life, keeping the soil healthy. Examples of these are: manures, fish emulsion, alfalfa meal, and cottonseed meal.

Water Soluble Fertilizers = fertilizers in a form that will dissolve in solution. Mixed with water, the solution can be sprayed on the foliage (foliar feeding- however, leaf burn may happen above 75 degrees) or used as a soil drench.

Slow Release Fertilizers = (organic or chemical) that are slowly converted for use in soil to feed plants. Example: osmocote. *Plants use nutrients in their ionic forms so it does not matter what source the nutrient originated, chemical or organic.* It is wise to feed the soil with organics several times a year to enhance healthy and abundant microorganisms, which are used to break down nutrients and make them available to plants. Almost all fertilizers, chemical or organic tend to make the soil more acidic.

A Final Word: KISS (Keep it short & simple)

I tell new rosarians to feed their rose plants small quantities of fertilizer on a consistent basis (example: one half cup of granular fertilizer per mature bush such as an HT, Shrub, OGR, Floribunda etc. every two weeks; one fourth cup for minis, minifloras, every two weeks) from February to November. Make sure the fertilizer has the macro and minor nutrients included. Supplement with other fertilizers every other month such as SulPoMag, Epsom salts, Fish Emulsion, Milorganite and Gypsum. Add organics in the spring and fall to enhance the soil organisms. Give bushes an extra dose of iron (Sequestrene, one tablespoon per gallon, three times a year, if needed). Watch for those beautiful Queens in your garden.... enjoy God's greatest flower gift to us...*THE MAGNIFICENT ROSE!!*



Gertrude Jekyll

Happy rose growing from the Rosequeen!

gatorrosequeen@verizon.net

Since all gardens vary, Connie recommends that you see a Consulting Rosarian for help with your own personalized feeding program!! This article originally appeared in *The Bulletin*, newsletter of the Bradenton-Sarasota Rose Society, Phil Paul, Editor.