

DSD Shares

Summary Sheet

Functional Area: DSD Library

Title of Article or Material: What Does Fertilization Mean to Roses?

Type of material: Word File PDF PowerPoint Spreadsheet Web hot link Other

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Date Submitted: 2-3-2010

Date Posted:

Date Last Updated:

Information Source(s): CR Class Material

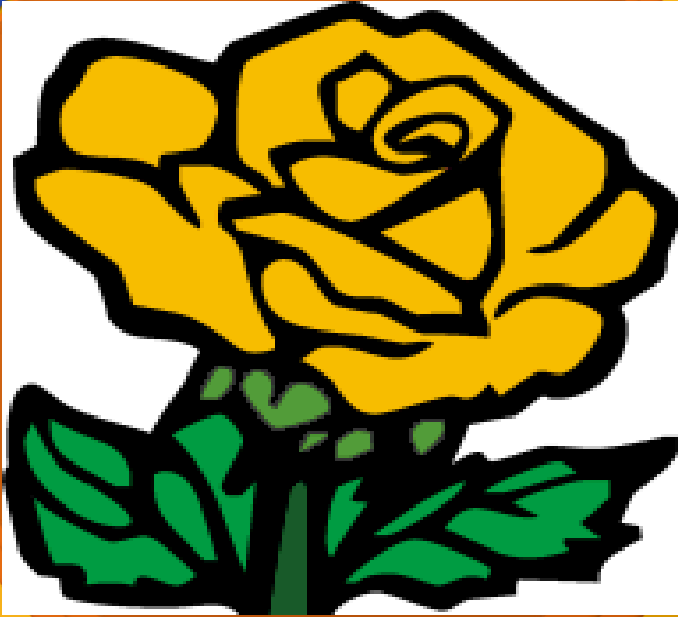
Target Audience for this information: CR candidates and CRs who missed Connie's talk at the 2010 Mid Winter Meeting; All rosarians

Abstract:

This presentation covers all aspects of fertilization and was prepared to instruct on Chapter 6 of the ARS Consulting Rosarian Manual. The information on nutrition or lack of it is very explicit with good graphics on lack of nutrition.

This package is a valuable reference for frequent use.

The CR Class requested that we post this material.



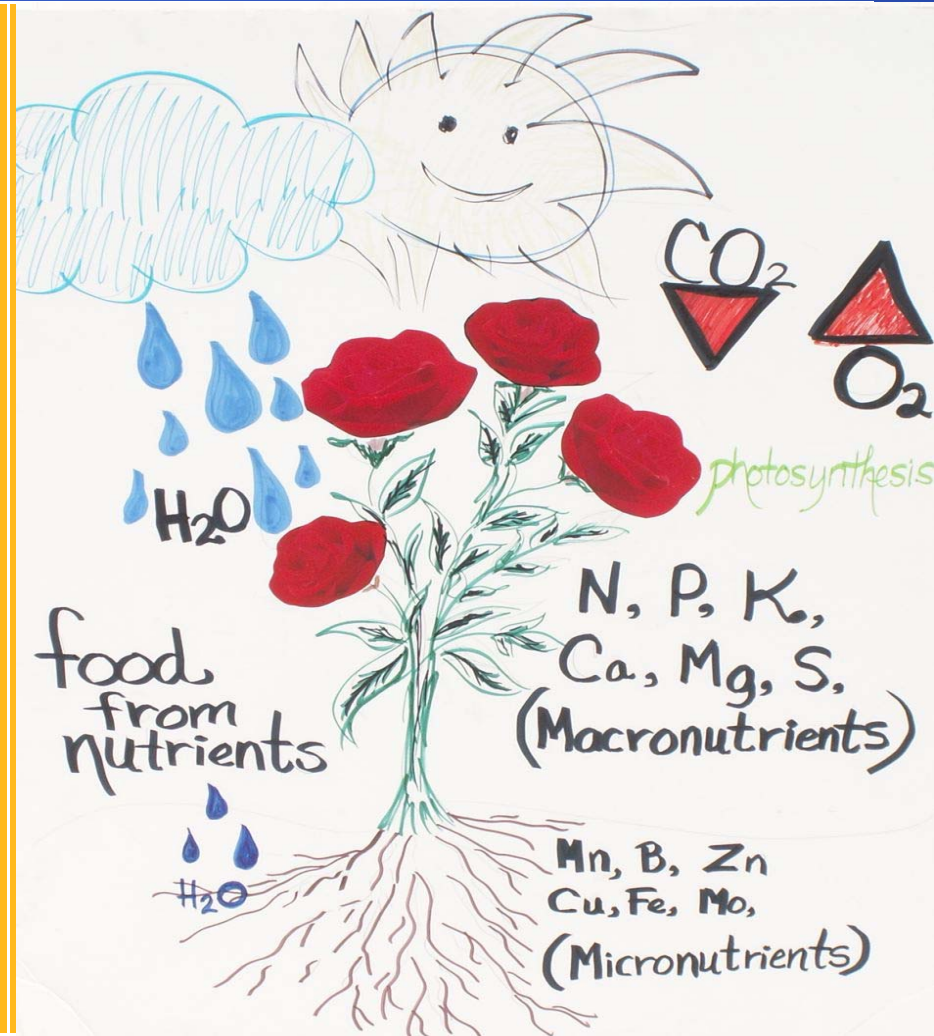
What does fertilization mean to roses?

**Aka, what can I use to grow a healthy
garden of roses and maybe even a "Queen"
of show?**

How your rose plants make food

Your rosebush 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 and make beautiful roses. The plant does not need the oxygen left over from the carbon dioxide and so the plant releases oxygen back to the atmosphere.

Carbon dioxide + water + energy =
sugar + oxygen



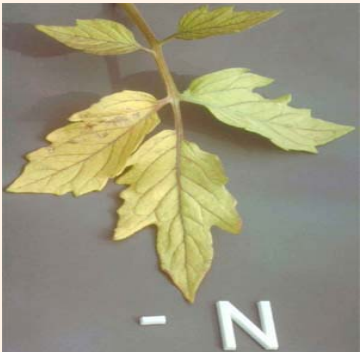
Fertilize means to make productive

- A bag of fertilizer has three main numbers. Ex: **20-10-30** (number represents % of NPK elements 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)
 - 3 Secondary Elements (Macronutrients)
 - 6 Trace Elements (very small amounts of element needed...Microelements) to grow healthy.

Primary Elements

- Nitrogen (N)
- Phosphorous (P)
- Potassium (K)

Nitrogen (N)

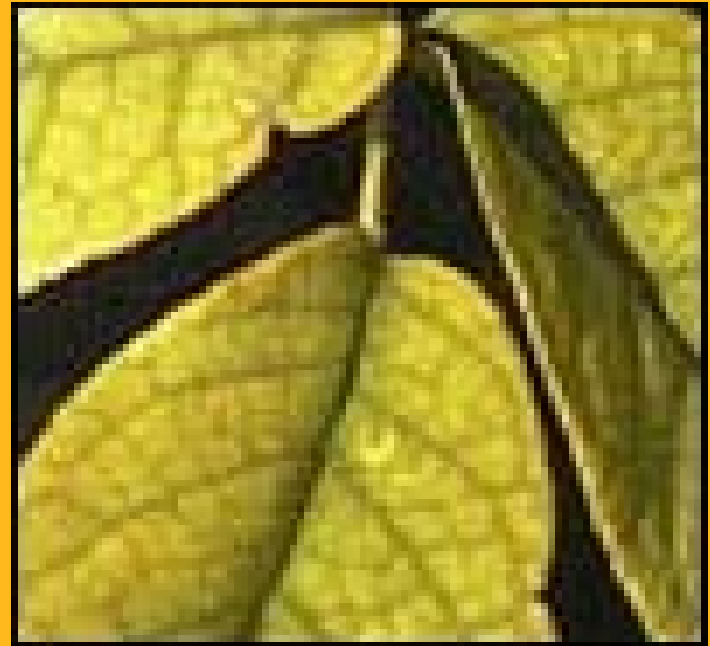
Element	Contribution	Source
<p>Nitrogen deficiency shows in older foliage, light green to yellow color of leaf, yellow veins; Nitrogen leaches <i>EASILY</i> from soil with too much rain; mostly available below 5.5 pH and above 7.5 pH . Lack of oxygen in soil after heavy rains can mimic Nitrogen deficiency.</p>	<p>Tall, strong canes, good blooms and green leaves.</p> <p>Be careful not to apply excessive nitrogen to plants because it creates vegetative centers in roses...OGR and English roses esp. (looks like the Green rose is growing in the middle of your bloom).</p>	<p>Inorganic Forms: <u>water soluble nitrate</u> (nitrate of soda, ammonium nitrate).</p> <p>Ammoniacal nitrogen-available after conversion in soil; Urea nitrogen slowly available after conversion in soil.</p>
<p>4 forms of nitrogen:</p> <ol style="list-style-type: none"> 1) Nitrate (WSN=water soluble nitrogen) *** 2) Ammoniacal 3) Urea 4) Nitrite (WIN=water insoluble nitrogen) 		<p>Organic Forms: Alfalfa Meal, Fish Emulsion, Sewage Sludge, Bloodmeal.</p>

Nitrogen and Iron Deficiencies


Clear yellow leaves and veins
= nitrogen deficiency




Clear yellow leaves and veins are green
= iron deficiency (chlorosis)



Phosphorous (P)

Element	Contribution	Source
<p>Phosphorus deficiency appears in older foliage developing dark red and purple colors. It becomes less available when pH drops below 6 or above 7.5 pH measures acidity of soil.</p> 	<p>Stimulates root growth; big bloom production; hastens plant maturity adding to winter hardiness.</p> <p>Phosphorus moves slowly through soil. Recommend adding superphosphate when planting new roses in a one "egg" size near feeder roots</p>	<p>Inorganic Forms: Superphosphate (and Triple superphosphate)</p> <p>Organic forms: Bonemeal, Fish Meal, Sewage Sludge</p>


Potassium (K)

Element	Contribution	Source
<p>Potassium deficiency usually is seen in older foliage. Leaf margins are brown, weak stems and many blind shoots.</p> <p>Potassium leaches <i>EASILY</i> from soil and becomes unavailable to plant below 6.0</p>	<p>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</p> 	<p>Inorganic forms: SulPoMag (SPM) Nitrate of potash (avoid using muriate of potash)</p> <p>Organic forms: kelp, seaweed, composted manures</p>


Secondary Elements

- Calcium (C)
- Magnesium (Mg)
- Sulfur (S)


Calcium (C)

Element	Contribution	Source
<p>Calcium deficiencies appear at growing tips-brown edges appear.</p> <p>Highest availability in pH range of 6.5-7.5</p>	<p>Cell wall growth; reduces dieback; improves vigor and strength of plant; neutralizes harmful acids; improves soil and leaches salts</p> 	<p>Inorganic forms: Dolomite, gypsum, rock phosphate</p> <p>Organic forms: Bone meal, manures</p> <p>Be aware of fresh manures applied to plants, may burn. Also, bacteria level is high.</p> <p>*** Rosarians MUST get a tetanus shot every ten years.</p>

Magnesium (Mg)

Element	Contribution	Source
<p>Magnesium deficiency will be shown in older leaves, yellowing starting from center of leaf with signs of dying tissue overlaying the affected parts;</p> <p>With a high rainfall, magnesium leaches from soil; highest availability in pH range of 6.5-7.5</p>	<p>***Promotes chlorophyll production which makes foliage green and healthy, disease resistant plants; increases basal break development.</p> 	<p>Inorganic forms: Epsom Salts, SulPoMag, Dolomite lime</p> <p>Organic Forms: manures, composts</p>

Sulfur (S)

Element	Contribution	Source
<p>Sulfur deficiency shows when veins of leaves become pale; available in pH range of 6.5-7.5</p>	<p>Essential to root growth; key element of several important amino acids, lowers pH</p> 	<p>Inorganic Forms: Epsom salts, gypsum, SulPoMag</p> <p>Organic Forms: manures, composts</p>

Trace Elements

- Iron (Fe)

- Zinc (Zn)

- Manganese (Mn)

- Copper (Cu)


- Boron (B)

- Molybdenum (Mo)

Trace Elements

Element	Contribution	Source
Iron (Fe) Deficiency shows in new young leaves at top of bush (chlorosis). Readily available at less than less than 6.5 pH	Essential in production of chlorophyll for green foliage. Regulates respiration of oxygen and sugar burning enzymes	Inorganic forms: Chelated Iron (Sequestrene) Organic forms: manures and meals that covert to usable form in acidic soil
Manganese (Mn) Deficiency in young leaves, brown, black spots next to veins. Available at less than a 6.5 pH	Enzyme activity for photosynthesis, used in respiration and nitrogen metabolism	Inorganic forms: Essential minor elements, Manganese sulfate Organic forms: Sewage sludge, manures and meals

Trace Elements

Element	Contribution	Source
<p>Boron (B) Available at less than 6.5 pH. Deficiency shows in terminal bud dying and leaves curling</p>	<p>Controls starch formation, stimulates cell division and flower formation</p>	<p>Inorganic Forms: Essential minor elements and in "20 mule team borax"</p> <p>Organic forms: trace amounts in manures, meals</p>
<p>Zinc (Zn) Deficiency shows mottled leaves, irregular yellow areas available at less than 7.0 pH</p>	<p>Stimulates stem growth and flower bud formation</p> 	<p>Inorganic forms: Essential minor elements, Zinc sulfate</p>

Trace Elements

Element	Contribution	Source
Copper (Cu) Deficiency is seen when terminal leaves get brown spots. Available below 7.0 pH	Stimulates stem development and pigment, enzyme activator	Inorganic forms: Essential minor elements, Copper Sulfate Organic forms: trace amounts in soil, manures and meals
Molybdenum (Mo) Deficiency shows in pale leaves with rolled margins. Available when pH is greater than 6.5	Needed to make amino acids to stimulate plant growth and for nitrogen fixation	Inorganic forms: Essential minor elements Organic forms: trace amounts in soil, sewage sludge

Element	Leaves to first show deficiency	Symptom
Nitrogen	Old	Pale green leaves and yellow veins
Phosphorus	Old	Premature leaf fall-off 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

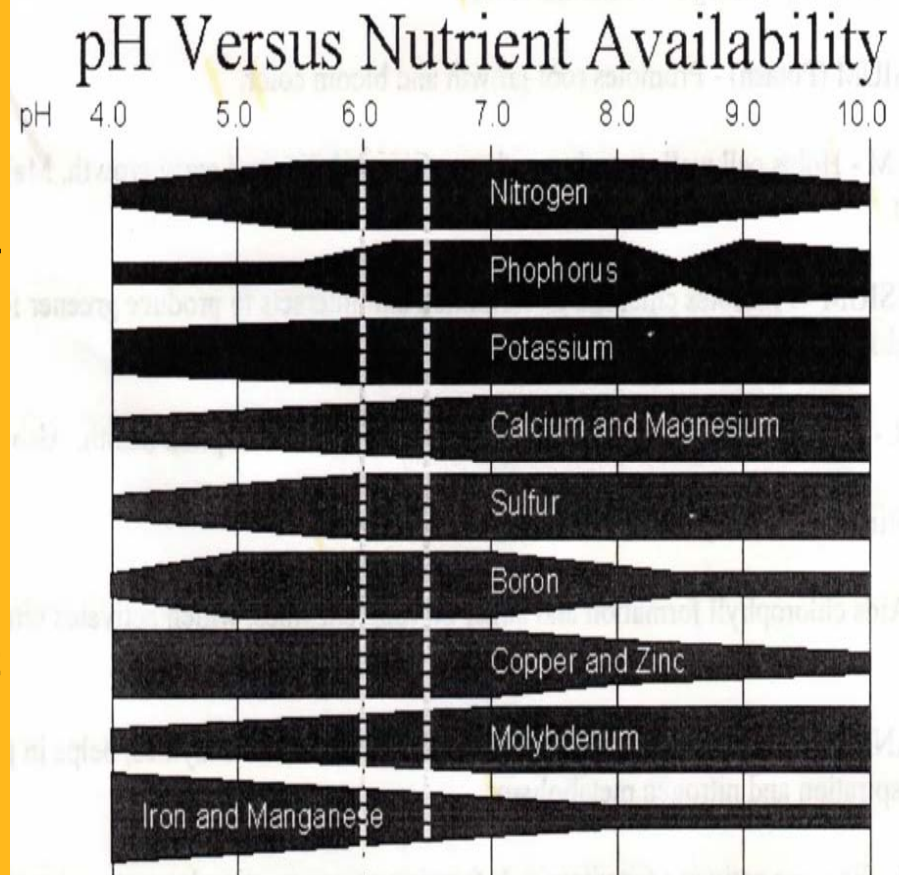
Availability of Nutrients

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 raises the pH.

Sulfur lowers the pH.

Amounts and frequency of product applied depends on your soil analysis (which should be done every year).



Types of Fertilizers

- **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 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...ex: manures, fish emulsion, alfalfa meal, cottonseed meal.

Types of fertilizers

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

Final Word to all CR'S: KISS

(Keep it simple sweetie)

- Feed your rose plants small quantities of fertilizer on a consistent basis (example: one half cup of granular fertilizer per mature bush, less for minis, minifloras, every two weeks) from February to November. Make sure the fertilizer has the macro and minor elements included. Supplement with other fertilizers such as SulPoMag, Epsom Salts, Fish Emulsion or Essential minor elements if the fertilizer does not contain them. Add organics in the spring and fall to enhance the soil organisms. Give bushes an extra dose of iron (Sequestrene several times a year if needed). Watch for those beautiful Queens in your garden....enjoy God's greatest flower gift to us...The Rose.

Since all gardens vary, see a
Consulting Rosarian for help with
your own personalized
feeding program!!

Happy Rose growing!

The Rosequeen

