FERTILIZATION OF FRUIT AND NUT TREES

BERRIES AND GRAPES

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March is an ideal time to fertilize fruit and nut trees.

An annual application of fertilizer is critical to the maintenance of healthy, productive fruit trees. The fruit plants must achieve sufficient growth each season to replenish the food reserves exhausted the previous year.

Carbohydrates and other food materials required to develop fruit on the plant are produced in the leaves by photosynthesis. When the plant is under fertilized, it produces fewer leaves and fruit production is often limited. Therefore, it is important that fruit plant leaves are dark green and there is adequate annual shoot growth. Yellowish or scorched leaves and a deficiency of shoot growth normally indicate fertility problems.

What kind of fertilizer to use---organic vs. chemical---is often confusing.

The advantages of one type of fertilizer over another have been debated for many years. The debate probably will continue for some time as long as people won't admit that there is a place for more than one type.

It is well known that chemical forms of nitrogen are very readily available to plants. As soon as ammonium or nitrate fertilizers dissolve in the soil solution, many plants can absorb them. Thus, they are extremely useful in rapidly correcting a deficiency of nitrogen in the soil. However, nitrates are readily washed out of the soil since they cannot be absorbed (fixed) on the surface of the clay particles. Therefore, watering or rain leaches them away easily. Ammonium is absorbed to considerable extent, but the free form (not fixed) of ammonium is rapidly changed to nitrates through chemical oxidation by certain soil organisms and can be lost through leaching (washing of nutrients from the soil).

Organic nitrogen sources are slower to act--a fact that appears to be a rather serious disadvantage at first glance. The nitrogen in most organic sources is in the amino acid or protein form and must be changed by enzymes in the bodies of microorganisms to the ammonium form of nitrogen. This process is called ammonification and is brought about by a number of microorganisms including bacteria and fungi.

The ammonium thus formed can be changed to nitrates as described above by two groups of bacteria. One group converts the ammonia to nitrites and the other group changes nitrites to nitrates. Oxygen is needed for both of these nitrification processes, hence, the desirability for good soil aeration. The ammonium can change to ammonia and escape as a gas, resulting in a loss of nitrogen from the soil and, of course, is no benefit to plants.

Sometimes under conditions of poor soil aeration, nitrates or ammonium are changed to free nitrogen that escapes into the atmosphere. Plant growth is generally poor under such conditions because of limited aeration and nitrogen deficiency (water plants apparently tolerate the conditions of limited oxygen).

These processes related to the change in the form of nitrogen take time and proceed very slowly when the soil is cool. When soil temperatures are cold (below 50 degrees F.) an application of organic nitrogen might take a long period of time to have any visible effect in improving a condition of nitrogen deficiency of a plant, whereas a chemical nitrogenous fertilizer would correct the trouble at once.

The organic forms of fertilizer are considerably lower in analysis than the chemicals. As such, more of the organic material must be applied to obtain the same amount of fertilizer per unit area. In some instances, it is impractical to do this because the bulk of material would be too great - - 20 pounds of manure for 1 pound of ammonium sulfate.

Because of their high analysis, quick solubility, and rapid availability, chemical fertilizers must be applied carefully. Overdoses cause the concentration of fertilizer in the soil solution to be greater than that in the plant, resulting in withdrawal of water from the roots. In severe cases, this induces wilting, or death. In milder cases the growth is stunted because of root injury.

Organic materials such as peat, rotted manure, etc., have long been known to improve soil structures. This can take place either through actual dilution of soil by particles of organic matter that they possess an environment favorable for root growth (lumps of peat hold air and water) or by furnishing food for microorganisms that secrete glue-like substances that cement the soil particles into granules of aggregates.

The addition of chemical fertilizers does nothing to promote soil improvement in this respect. Organic fertilizers promote these beneficial effects, but the amounts added are rather small so that their influence in this regard is not too great. No one should hope for continued improvement or maintenance of favorable soil structure by use of organic fertilizers alone - - incorporation of large amounts of organic materials (not fertilizers) are needed for this effect.

Because soil conditions vary greatly from place to place a generalized, blanket recommendation can be only used as a general guide. However, because of the abundance of potassium in this area's native soil and because of the build-up of phosphorus that occurs after several seasons of fertilizing with a complete fertilizer such as 10-10-5 or 15-10-10, a high nitrogen fertilizer can be recommended as the best for most growers. To continuously use a balanced fertilizer in gardens and around trees invites the occurrence of nutrient deficiencies of minor elements such as iron and zinc. If you don't believe it, look how many yellowing plants from iron chlorosis are ever-present in this area - - we do not need to accentuate the problem with improper fertilization practices.

Peach and plum trees should receive one-half pound or 1 cup of ammonium sulfate (21-0-0) per year of age or per inch of trunk diameter with a maximum limit of 5 pounds per tree. In addition, mature trees should receive an additional cup of ammonium sulfate in late August. First and second year-old trees should receive one-half cup of ammonium sulfate during the months of April, May and June.

Apples, pears, and persimmons, normally require little fertilization. This is to prevent the stimulation of excess growth that is very susceptible to the disease fire blight. Applying a cover spray of streptomycin or Kocide to apple, loquat and pear trees immediately before, during and after the bloom period can also decrease severity of fire blight infection. The trees should make 6-12 inches of annual growth, otherwise nitrogen fertilizer will be required. Follow the formula above for peach trees if growth is poor.

Fertilizer requirements for fig trees should be gauged by the amount of growth made in the previous year. The shoots should grow about 12-18 inches each year. In general, one-half pound of ammonium sulfate per year of tree age should be applied with a maximum limit of 10 pounds.

Pecans require one pound of ammonium sulfate per inch diameter of tree trunk of established trees. Fertilizers with zinc added are of little benefit in alkaline soils- - zinc will have to be added to the tree foliage by spraying zinc sulfate or NZN solutions directly on the leaves.

Blackberries should be fertilized twice each season; in early March and when harvest is completed, usually in June. About one-half pound of ammonium sulfate fertilizer scattered around plant is recommended for each application.

Grapes should receive one-half pound of ammonium sulfate per vine depending on the vigor of the vine. Overly vigorous grapes are undesirable because they are not as productive.

When applying fertilizer for trees around which lawn grass is growing, it is advisable to apply a little extra to take care of the fertilizer utilized by the grass. You may also want to punch four-inch deep, randomly spaced holes within the canopy drip line of the tree in which to distribute the recommended quantity of fertilizer if phosphorus is needed. However, this is not necessary for nitrogen only applications since tree roots will uptake surface nitrogen applications.

The important consideration to remember is that plants, as most living things, need food to grow and produce. The "food" of plant life is fertilizer and it must be available to the plant when needed if optimum growth and production are expected. In addition the plants do not care nor does it matter whether the source is organic or inorganic.

PECANS:
Research on pecan trees has shown that nitrogen and zinc are by far the most needed elements. Nitrogen is always needed in combination with deep, well-drained soil,

irrigation with clean water, and frequent (every two weeks) early season zinc foliage sprays for excellent tree growth and regular crops of high quality pecans. Zinc and nitrogen are not the same. Nitrogen is applied to the soil as a commercial fertilizer while zinc is sprayed onto the leaves in early spring. Soil applications of zinc or foliar applications of nitrogen are not as effective.

Too little or no nitrogen results in poor vigor or no tree growth. Too much nitrogen can result in excessive growth on large trees and late season growth on young trees. Excessive growth on bearing trees uses plant food and can reduce the nut producing capacity of the tree. Keeping this in mind, bearing trees should not make over 12 inches of shoot growth on non-bearing terminals. Also, young trees should stop growing in September to prevent freeze injury in October or November.

The perfect situation is to have young trees make fast growth in April, May and June, moderate growth in July and August and stop growth in September.

On mature trees, shoot growth and leaf expansion should occur in April, May and early June.

On young trees, fertilize only once the first year in late May or early June. Salt burn on the leaves can occur if fertilizer is placed in the planting hole or applied around the trees before roots are established and pecan roots begin growth late in the spring.

From the second to seventh year, apply 4 light applications, one each month in March, April, May and June. Do not apply the first applications until the trees start to grow. Nitrogen burn or small black leaves can result if nitrogen is applied too early. Never apply nitrogen after the month of June to young trees because it can encourage late season growth and result in severe freeze injury in November or December.

The first year apply one cup or ½ pound of ammonium sulfate (21-0-0) to the tree in late May 18 to 24 inches from the tree. Never apply granular nitrogen closer than 12 inches to the trunk. If the tree is not making good growth by mid-June, do not fertilize the first year.

The second year make March, April, May and June application of 1/2 pound of ammonium sulfate fertilizer.

The third, fourth and fifth year apply 1 pound in March, April, May and June.

The sixth and seventh year apply 2 pounds in March, April, May and June.

As the trees become larger, use 1 pound of ammonium sulfate per inch of trunk diameter. Split this amount into applications-March and May. Broadcast this fertilizer toward and slightly beyond the drip line.

Very few cultural practices will give better pecan tree growth responses than good fertilization. Nitrogen fertilizer is essential for good tree growth. Consistent annual nitrogen fertilization is very important in insuring regular nut crops year after year.

Most of the fertilizer recommendations above call for ammonium sulfate (21-0-0). It is readily available and fairly inexpensive. In the home landscape with few trees, the slow-release fertilizer formulations such as 19-5-9 and 15 -5-10 can be substituted for ammonium sulfate for the first application. The use of a slow-release formulation will reduce the risk of plant damage by accidental over-application of fertilizer and will also not burn plants growing near and around the target tree. Regardless of how it is applied or what type is used, remember that fertilizer is the tree's food. Don't let your tree go hungry this year.