

Minerals And Amounts Needed In El Dorado County

Nitrogen Crop production is improved by annual applications of nitrogen (N) on all El Dorado County soil types. Plants deficient in N lack vigor and green color. Apply 100 to 150 pounds of N per acre in one application for plants on shallow soils and for shallow-rooted plants. The least expensive N fertilizers are: urea (46% N -should be irrigated or cultivated into the soil), ammonium sulfate (21.5% N - highest acidifying action) and ammonium nitrate (33.5% N). Nitrogen also is obtained from calcium nitrate (16.5% N - gives basic soil reaction countering acidity), mixes such as 16-20 (16%N) and 12-12-112 (12%N) and organic fertilizers such as poultry manure (2 to 4%N) and bonemeal (3% N).

Phosphorus-Most red-colored soils lack available phosphorus, because iron and phosphorus form into slightly soluble compounds. Phosphorus deficiency is characterized by dull appearing foliage and spindly or weak growth. Leaf margins, petioles and tips may be tinged with a reddish-purple color--especially in the case of certain grasses. Previously untreated soils can have phosphorus brought to adequate levels for shallow-rooted crops with a broadcast application of 250 pounds of treble super phosphate or 500 pound of single super phosphate per acre. Deep-rooted fruit trees should receive twice this amount. Phosphorus levels can then be maintained with annual applications of 16-20-0 or triple 12, 14 or 16.

Potassium- Shallow soils and soils cropped for many years may have inadequate potassium levels for some crops. Potassium deficiency is characterized by upward rolling and scorching of leaf margins and pale color in many plants. A deficient soil may be replenished by applying 1000 pounds of sulfate or muriate of potash per acre. Levels can then be maintained by annual applications of triple 12, 14, or 16.

Zinc- Many El Dorado County soils are low in zinc, but most plants perform reasonably well without treatment. Fruit trees may occasionally show deficiency symptoms. Leaves are small, narrow, closely spaced and mottled with yellow. Lateral leaf buds may fail to grow. Foliar sprays of basic zinc sulfate (5 lbs. per 100 gallons) are generally applied for correction. Zinc sulfate applied to the soil surface may be effective where PH does not exceed 6. Try 300-500 pounds of zinc sulfate per acre.

Magnesium- Rapidly growing young trees or heavily cropped fruit trees may exhibit symptoms of magnesium deficiency, which are yellowing of leaf margins and between veins and defoliation of basal leaves on shoots during August and September. The problem is caused by the temporary inability of roots to supply the plants magnesium requirements. Little harm usually results. If the condition reoccurs or becomes severe, magnesium sulfate (Epsom salts) may be sprayed on the foliage in late spring at the rate of 10 pounds per 100 gallons of spray.

Boron- This mineral may be lacking for some crops throughout the County. Pear trees and walnut trees are good indicators of boron deficiency as vigorous shoots will dieback on leafing in early spring. Very small amounts of boron will correct a deficiency and very little more can cause an excess. Fifty pounds per acre of agricultural borax provides correction for tree to five years, although it may take a year before symptoms disappear on fruit trees. A spray application of soluble boron formulation may be used to provide quick (temporary) correction. Use 1 to 2 lbs./100 gallons.

Geographic Differences In Fertilizer Needs

Nearly all plants on soil types in El Dorado County benefit from annual applications of nitrogen. Responses to phosphorus and potassium are variable and depend on plant requirements as well as soil supplies. Lawn grasses do not respond to potassium. Most vegetable crops do respond to phosphorus treatments. Newly planted orchard trees need phosphorus fertilization, but older trees may not.

As a general rule, shallow soils (2 feet deep) should be fertilized annually with all three minerals-- nitrogen, phosphorus and potassium. Most soils below 1500 feet elevation are shallow, the Rescue series soils around Rescue being an exception. El Dorado Hills, Shingle Springs, El Dorado, Pilot Hill and Cool are surrounded by shallow soils.

Many of the soils above 2000 feet are deep (40 + inches). They seldom need to be fertilized with potassium, but many plant species will perform better after phosphorus fertilization. Red colored soils usually have very little available phosphorus and massive applications of phosphorus may be needed to overcome deficiency symptoms in plants grown on them. Kelsey, Garden Valley, Georgetown Placerville, Camino, Pollock Pines, Pleasant Valley, Omo Ranch and many locations in between have severely phosphorus-deficient soils.

The deep granite soils found around Fairplay, Aukum, Upper Sandridge and Somerset require phosphorus for starting trees and growing vegetables, but probably have adequate supplies for mature tree. They should have adequate potassium levels.

Fertilizing Young Fruit Trees

Fertilizing young fruit trees is very important in helping them resist disease (see publications, Bacterial Canker and Blast of Deciduous Fruits #2155 and Pacific Flatheaded Borer #7042) and to develop strong frameworks for carrying heavy crops. Nitrogen and phosphorus are the two minerals that frequently need to be added to the El Dorado County soils to obtain vigorous growth of young trees. Phosphorus is most easily supplied by adding it at the time of planting.

Dig the hole 3 to 4 inches deeper than required to accommodate to the bottom of the hole. Cover with several inches of soil. Place the tree in the planting hole and add soil until all roots are covered with several inches of soil. Tamp the soil gently with your feet. Then add the same amount of phosphorus as applied to the bottom of the hole. Cover with soil to fill the hole.

This phosphorus application should be adequate at least until the tree starts bearing.

While other sources of phosphorus may be used (manure, bonemeal, planting tabs), best results have been obtained with treble super phosphate in commercial orchard tests.

Nitrogen should be applied to young fruit trees two to three times a season to promote an optimum growth rate. Ammonium nitrate is recommended as nitrogen is immediately available from the nitrate fraction, while the ammonium fraction moves into the soil more slowly becoming available as soil organisms convert it to nitrate.

Do not apply nitrogen on newly planted trees until the soil has been settled around the roots by rainfall or irrigation. Use 1/4 pound ammonium nitrate, directing the granules into area 6 inches to 3 feet from the trunk

As the tree grows in size increase the amount of ammonium nitrate by 1/4 pound for each 30 square feet increase in the tree canopy.

Fertilizing Mature Fruit Trees

The most efficient time to fertilize mature trees is late August to early September. When irrigated into the soil, the trees have ample time to pick up and store nitrogen to meet the needs of rapid growth the following spring. Winter and early spring applications are not taken into the tree until active growth takes place. Heavy rains can cause nitrogen leaching losses. If fall nitrogen applications are missed, apply nitrogen fertilizers when new fruit tree shoots are about four inches long.

Mature trees should be fertilized at least once a year with nitrogen. The number of applications and the amounts applied are best determined by evaluating the desirability of tree vigor and color obtained from previous applications. Young trees usually do well with less than 100 pounds of actual nitrogen (see page 7, "How much Fertilizer is in a Bag") per acre/year, while older trees may require over 150 pounds.

Mature fruit trees may or may not respond to phosphorus and potassium. Cropping will eventually cause deficiencies in soils less than 3 feet deep and annual applications are recommended as shown on page 2. All red colored soils should be treated annually or periodically with phosphorus. Where potassium is not deficient 16-20 is recommended for annual applications of nitrogen and phosphorus. Poultry manure applied every third year will also maintain phosphorus levels (see page 2).

Organic Versus Inorganic Fertilizers

Organic fertilizers are highly desirable, when they contain adequate mineral levels. Horse manure and cow manure are marginal in this respect. Poultry manure is recommended, provided it is not adulterated with excessive floor litter.

Organic fertilizers contain most needed nutrients and are a source of essential organic matter. However, these fertilizers are usually expensive and sometimes not readily available.

Less expensive inorganic fertilizers can be effectively used provided soil organic matter is maintained at desired levels. This can be accomplished by adding organic material such as compost (see U.C. Leaflet #21251 "The Rapid Composting Method") or garden clippings and plant refuse. Beware of adding organic materials obtained away from own yard, such as garbage. This may introduce diseases and nematodes into your soil.

The easiest and most practical way to add organic matter is to rotate a garden crop with green manure crop such as oats and vetch or even a plain crop of weeds.

For additional information on this topic, see U.C. Leaflet #2572 "Organic and Inorganic Fertilizers and Soil Amendments".

How Much Fertilizer Is In The Bag

By law, commercial fertilizer companies must display on the bag of fertilizer the percent of nitrogen (N), phosphorus (expressed as P_2O_5), and potassium (expressed as K_2O), in that order. A fertilizer sold as 10-10-10 must contain not less than 10 percent of each nutrient --N, P_2O_5 , and K_2O . However, a fertilizer formulation does not have to contain all of these nutrients. A 21-0-0 fertilizer, for example, contains 21 percent N and no phosphorus or potassium and would be useful in soils needing only nitrogen. In 100 pounds of this fertilizer, there are 21 pounds of "actual" nitrogen.

How About Liming

Most El Dorado County soils are naturally slightly acid (PH 5.5 to 6.5.). Liming is not necessary to adjust soil acidity, useless acid-forming fertilizers have been used for many years. Liming may give a mild plant response by releasing phosphorus, but it may also induce potassium, magnesium and zinc deficiencies.

Soil Analysis

Soil analyses are useful only if samples are properly collected and results are interpreted by experienced crop specialists. Because of the state of the art and costs, we don't encourage their use. If you want one, see UC Special Publication #3024 "Commercial Analytical Laboratories In California Available for Agricultural Testing" for listing of commercial laboratory services and ask for "Soil Tests" to learn proper sampling techniques. The latter also describes how to conduct your own fertilizer trails.

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