

Crop Information

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Cherry Nutrition

DEFICIENCY SYMPTOMS

This TECH BULLETIN is for visual observation use and reference only and may make the grower more aware of the visual symptoms that occur in the orchard. "CAUTION" should be taken in that some symptoms do look alike and a misdiagnosis could be possibly disastrous. Confirm all of your observations with Laboratory analysis. The following symptoms indicate that an acute problem exists, and yields may already have been reduced. Symptoms are also easy to mis-diagnose or may be present and not visible known as hidden hunger. tissue analysis not only confirm visual symptoms but identify "hidden hunger".

Nitrogen

Nitrogen deficient trees are generally low in vigor and productivity. Since shoot length is reduced, trees may produce abundant spurs and flower buds. Leaves are pale green in color, and may develop a reddish tint late in the season. Older, basal leaves typically exhibit the earliest and most severe symptoms, although all leaves may be off-colored on severely deficient trees. Leaves are smaller and often drop prematurely. Fruit are small and earlier to mature.

Nitrogen deficient trees are more susceptible to winter cold injury. The reduced shoot growth and decreased flowering tend to lower production. Fruit are smaller, even when trees are thinned to the same fruit load as a tree with better nutrition.

Although excessive N rates are seldom toxic to plants, heavily N fertilized trees stimulate vigorous, late-season growth which is also subject to winter injury. Fruit maturity is delayed on heavily fertilized trees. Trees are delayed from going into dormancy and K levels are out of balance which also makes the trees more prone to winter injury than a well balanced tree.

Nitrogen tissue levels should be maintained between 2.2 - 3.4%.

Phosphorus

Symptoms of P deficiency begin with weak, slender shoot growth and leaves with a dark green color that eventually turns bronze or reddish purple. Leaves develop a very characteristic leathery texture. A red coloration appears on petioles and young shoots. Eventually leaf size is reduced, and premature defoliation may occur, beginning with basal leaves.

Root growth is usually reduced substantially by P deficiency. Leaf P concentrations in midsummer are normally between 0.16 and 0.40%. Concentrations decrease through the season, so samples taken earlier are normally higher in P than late season.

Potassium

The first symptoms of K deficiency are a slight upward curling of leaf margins. The undersides of leaves turn bronze in color and the margins of leaves eventually become necrotic or "scorched". Leaf curling and scorching is usually most severe on the basal leaves of current season growth, but may also appear on terminal leaves. Shoot growth and leaf size are reduced. Symptoms are most severe on trees carrying a heavy crop of fruit, since fruit accumulate relatively large amounts of k at the expense of the other tree parts. Leaves may drop prematurely from severely affected trees.

Leaf analysis provides a useful measure of the K status of trees and the likelihood that applications will be of benefit. Sufficient leaf K concentrations are between 1 and 3%, whereas trees with leaf levels less than 1.0% are generally considered deficient. Leaf K levels are influenced by the sampling time and crop load.

As K uptake by foliar feeding of most products is less than 7% one should select a product that contains Potassium Carbonate as it is much more efficient in uptake by the foliage with lower leaf phytotoxicity.

Calcium

Calcium deficient trees exhibit reduced shoot growth due to shortened internodes and shoot growth is minimal. This is followed by defoliation and twig die back. Symptoms on young trees include light brown to yellow markings on leaves. Leaves may become tattered with numerous holes. Leaf blades often roll inward and upward and may develop large chlorotic areas before they abscise. Cherry leaves normally contain 0.7-3.0% Ca.

Fruit will have a poor shelf life, reduced flavour and the tree will have reduced vigour.

Magnesium

Magnesium deficiency often occurs in sandy soils or soils that are naturally low in Mg (soils less than 10% saturation Mg). It can also be induced by heavy applications of K or K applications in the spring that do not contain Mg.

Deficiency symptoms include an interveinal browning and necrosis starting first on basal (older) leaves. Browning may start in the middle of leaves or progress inward from the margins. Bright red or yellow coloration may border necrotic areas. Affected leaves may fall prematurely. Healthy cherry leaves typically contain 0.4 - 0.9% Mg.

Sulfur

Sulfur deficiency is not common in cherries. Sulfur deficiency is characterized by uniformly yellow leaves at the shoot tip. Symptoms are similar to those of N deficiency except for the location along the shoot; N-deficient plants are more uniformly affected along the shoot.

Iron

Terminal leaves on deficient trees turn chlorotic to bright yellow between the veins. Veins remain green and stand out against the rest of the leaf. Although terminal leaves are first affected, symptoms may progress in a basal direction to include older leaves. Tissue along the margins of severely affected leaves may die.

Zinc

Zinc deficiency is common in cherries. It has often been called "little leaf", because rosettes of small pointed leaves form at shoot tips.

Shortages cause reduced leaf size and irregular mottling and chlorosis of leaves. Leaves may drop prematurely. Shoots typically fail to elongate normally. This shortens the inter-node distance between leaves and results in tufts or "rosettes" of leaves at the tip of shoots. Affected limbs may be confined to certain portions of the tree or distributed uniformly throughout the tree. Buds on the previous years growth may fail to open, resulting in lengths of shoots which are void of leaves. Fruit size and soluble solids content are severely reduced. Zinc deficiency is common when soil pH is high, but shortages are reported on all soils in Ontario. Zinc levels should be greater than 25 ppm.

Zinc application late in the season will also help fortify the bud and reduce winter injury.

Manganese

Symptoms include interveinal chlorosis similar to that caused by zinc deficiency. Chlorosis starts at the margins of leaves and progresses inward between the main veins. Leaves are typically smaller and shoot growth is inhibited in proportion to the severity of the leaf symptoms. In mild instances symptoms may be most apparent on spur leaves, though spur and shoot leaves are affected in severe cases. Fruit yields and quality may be reduced severely. Fruit from affected trees are well colored and firm, but small and lacking in juice.

Symptoms tend to be general over the whole tree, although apical leaves often appear less affected. Severe deficiency causes some defoliation and shoot dieback. Moderate symptoms, however, don't seem to induce a reduction in shoot growth or yield. Temporary deficiency symptoms can occasionally be found in the spring under conditions of poor root growth induced by low soil temperatures.

Boron

Boron deficiency and toxicity occur periodically in cherry orchards. Deficient trees exhibit little shoot growth. Some buds may fail to open in the spring, whereas others may open, then shrivel and die. Shoots may grow for some time, then tips cease growth and die. Leaves are distorted in shape, with irregular serrations. Leaves may cup or roll in a downward direction and feel thick and leathery. These vegetative symptoms typically develop only if leaf B concentrations are lower than 20 ppm. Boron applications may improve fruit set and yield in sour cherry trees containing B levels as high as 30 ppm and exhibiting no visible symptoms.

Boron deficiency is often undetected because of the effects that are undetected. Poor pollination, small cracking of the bark on new growth leaving the tree open to other infection and poor uptake of K in dry years. Boron also helps the bud over winter when supplied late in the season.

Mobilization of Ca to fruit and formation of new roots throughout the season are also affected by boron nutrition.

Cherries however are sensitive to excessive Boron levels. Toxicity symptoms include a dieback of twigs accompanied by gumming. Severe toxicity may induce gumming along main limbs and trunks. Leaves are normal in shape and size but necrotic zones may develop along main veins. Flower buds may fail to open and few fruit are set. Leaf B levels of 150 ppm are approaching a toxic level.