

MANGANESE FACTOR

Mn

Deficiency Symptoms	Plant leaf tissue shows yellowing, while veins remain green. Mature leaves may be “mottled”. First signs of deficiency often show up as small, pin-head sized, black specks on leaves. Flower formation is reduced. Young cotton leaves are yellow, (lower leaves are less affected) sometimes gray to reddish gray between veins. The veins remain green. Manganese deficiency will delay maturity.
Functions In Plant	Aids in Chlorophyll formation: serves as a catalyst in enzyme reactions such as breakdown of carbohydrates, and Nitrogen transformation.
Mobility In Plant	Relatively immobile.
Mobility In Soil	Relatively immobile (soluble forms are usually converted into insoluble forms within 1 year).
Influence Of Soil ph	The availability of Manganese drops off sharply as the pH rises from 5.0 – 7.0.
Factors Affecting Level	<ol style="list-style-type: none"> (1) High pH (2) Low organic matter usually means low Mn levels (3) Some very sandy soils are low in Manganese (4) Poorly drained, calcareous fine textured soils are often low in Manganese.
Factors Affecting Utilization	<ol style="list-style-type: none"> (1) pH (2) High levels of Iron, Copper, and Zinc may reduce uptake of Manganese (3) Problems show up more during dry years-apparently because of better drainage, thus more oxidation and less solubility of Manganese.
Level In Soil	Varies widely. Total Manganese may be thousands of lbs. per acre. Available Manganese 0 - 50 lbs. per acre.
Adequate Level In Plants	23 ppm in Soybeans 25 – 60 ppm in Cotton.
Correcting Deficiencies	<ol style="list-style-type: none"> (1) Broadcast 4 – 20 lbs. Manganese per acre (<i>the rate depends on soil pH and particular crop sensitivity</i>) (2) Band applications are about 5 times as effective as broadcast, so 1- 4 lbs. per acre is satisfactory (3) Spray 0.5 – 0.7% Manganese. <p><u>Sources</u>-Manganese Sulfate is preferred over Manganese Oxide unless the pH of the fertilizer carrier is very low.</p>
Sensitive Crops	Soybeans, small grains. (Cotton is moderate).
Remarks	<ol style="list-style-type: none"> (1) Manganese is usually applied in association with other fertilizers. (2) The more acid forming the fertilizer, the more available the Manganese will remain. Manganese toxicity occurs quite often below pH 5.0. “Crinkle leaf” of cotton is a result of Mn toxicity. Symptoms look much like thrip damage. Plants vary widely in their response to Mn.