



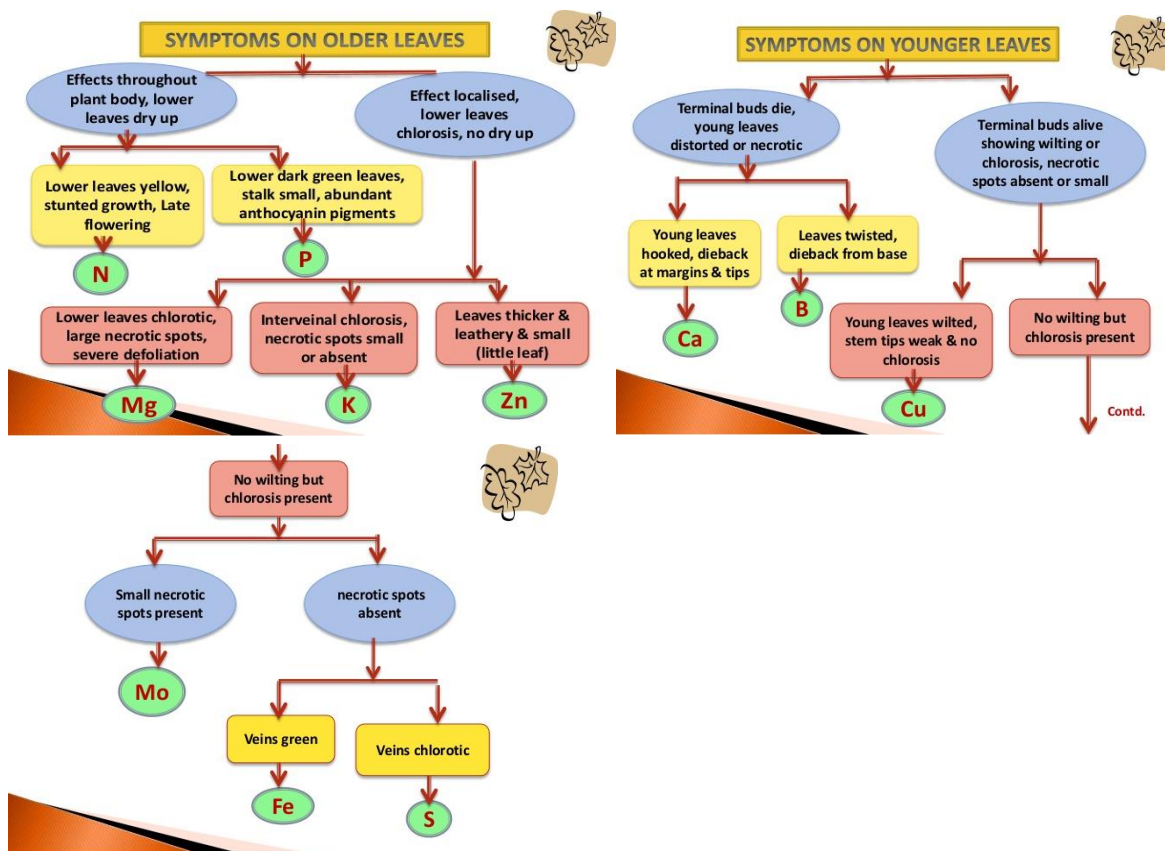
Micro-Nutrients Deficiencies in Fruit Plants and Their Reclamation

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Introduction

Plants are required 18 essential plant nutrients for growth and development. The most important micro nutrients, the deficiency of which has been seen on fruit plants grown on light textured soils of Rajasthan. These nutrients are micro in the sense that they are available in the soils in very minute quantities and are required by plants in small amounts, but more important as major nutrients for their role in plant growth and metabolism of plant. The fruit growers in the state are confined primarily to the application of major nutrients and generally skip micro-nutrients application, as a result of which the deficiency of these micro-nutrients appears in fruit plants, leading to reduced plant growth, fruit quality and yield. However, the deficiency symptoms of different micro-nutrients appear differently on fruit plants. The information regarding appearance of micro-nutrient deficiency symptoms and their management with the application of micro-nutrient fertilizers is described in detail. Soils prone to micronutrient deficiencies Zinc deficiency is commonly encountered in coarse textured soils having high pH, high calcium carbonate and low organic matter. Soils of Bharatpur Eastern plain flood prone II B areas and with high phosphorus content also become Calcium like zinc deficiency. Use of sodic irrigation water (containing high amounts of bicarbonates) may also lead to zinc deficiency in plants. The iron deficiency on the other hand is a serious problem in highly permeable coarse textured soils having high pH and low organic carbon. Fruit plants grown on soils having high calcium carbonate content may also suffer from iron deficiency. Zinc deficiency: Zinc deficiency in fruit plants appears on newly emerged fully developed leaves as yellowing of areas between mid-ribs called as interveinal chlorosis. However, under acute zinc deficient situations the affected leaves become entirely yellow while the mid-rib, vein and tissue along-side them remains green. The newly emerging leaves remain small in size and narrow with pointed tips. The growth of twigs is also paused and the inter-nodal distance (distance between the nodes) is reduced, that gave the branch a rosette appearance. With the advancement in deficiency period, the twigs also start dying back. In citrus, fruit bud formation is severely reduced and terminal leaves remained small and narrow under zinc deficient situations.



Reclamation on zinc deficiency Citrus: Zinc deficiency can be reclaimed by foliar application of zinc sulphate. In citrus, spray the plants with 0.3% zinc sulphate solution (300g zinc sulphate per 100 litres of water) during April-May on spring growth. However, on summer flush the spray should be done in June and on late summer flush zinc sulphate should be sprayed during August-September. In case of severe zinc deficient conditions, the plants should be sprayed with 0.45% zinc sulphate solution (450g zinc sulphate per 100 litres of water). In citrus, zinc deficiency becomes acute immediately after first fruit set on plants; therefore, one maintenance spray of 0.3% zinc sulphate solution should be given in April from the third year of planting.

Mango:

Guava: Zinc deficiency in guava plants reduce leaf size and develop interveinal chlorosis. As and when the zinc deficiency symptoms appear on plants, they should be sprayed with zinc sulphate + lime mixture (1.0kg zinc sulphate+500g un-slaked lime) dissolved in 100 litres of water. During June to September, the guava plants should be sprayed two-three times at 15 days interval.

Pear: In pear, zinc deficiency appears on young leaves as diffused interveinal chlorosis. Leaves remain small in size and the edges tend to curl upward. Immediately after the development of zinc deficiency symptoms on pear plants, the plants should be sprayed with a solution prepared by dissolving 3.0 kg zinc sulphate+ 1.5 kg un-slaked lime in 500 litres of water. Spray the plants twice or thrice after 7 to 10 day's intervals.



Plum: Zinc deficiency in plum generally appears during summer season on current season growth. Therefore, zinc deficient plum plants should be sprayed during the period with a solution of zinc sulphate and un-slaked lime. The solution can be prepared by dissolving 3.0 kg zinc sulphate+ 1.5 kg un-slaked lime in 500 litres of water. In case of severe zinc deficiency, the plants should be sprayed with 0.45% zinc sulphate solution.

Iron deficiency: Iron deficiency in fruit plants grown in Rajasthan is generally seen in orchards established in areas with soils having light texture, alkalinity and high calcium carbonate content. Because it is immobile in plant system, therefore it is not transported from older to younger leaves. As a result of which iron deficiency symptoms generally appears on newly emerging leaves, while the older ones remain green. The affected newly emerged leaves showed a sign of interveinal chlorosis as yellowing of leaves with green veins. The conspicuous symptoms of iron deficiency are therefore, the development of green net-work of veins over light green coloured background. However, under acute iron deficient conditions die back of twigs may also start. Even, the new leaves may open/unfold without any green colour and later veins may turn green. Iron deficiency in fruit plants can be ameliorated by foliar application of ferrous sulphate.

Reclamation of iron deficiency

Peach: Iron deficiency in peach plants grown on light textured soils having high pH is generally seen during summer and rainy season. The typical iron deficiency symptoms appear by the second fortnight of March. However, with the advancement of iron deficiency period the deficiency symptoms become more acute. Iron deficiency in peach plants can be ameliorated by foliar application of 0.3 % ferrous sulphate solution prepared by dissolving 300 g ferrous sulphate in 100 litres of water. Spray the plants during April on spring flush, during June in summer flush and during August-September in late summer flush.

Pear: Iron deficiency appears on apical leaves in the form of dark green veins on pale green background. This can be corrected by spraying 0.3% ferrous sulphate solution (300g ferrous sulphate/100 litres of water). Iron deficiency in plum can be ameliorated by foliar application of 0.3% ferrous sulphate prepared by dissolving 300g ferrous sulphate in 100 litres of water. Important Tips

- Do not use micronutrient mixtures
- Do not mix fertilizer, weedicides or insecticides with micro-nutrients
- Ferrous sulphate should always be applied as spray