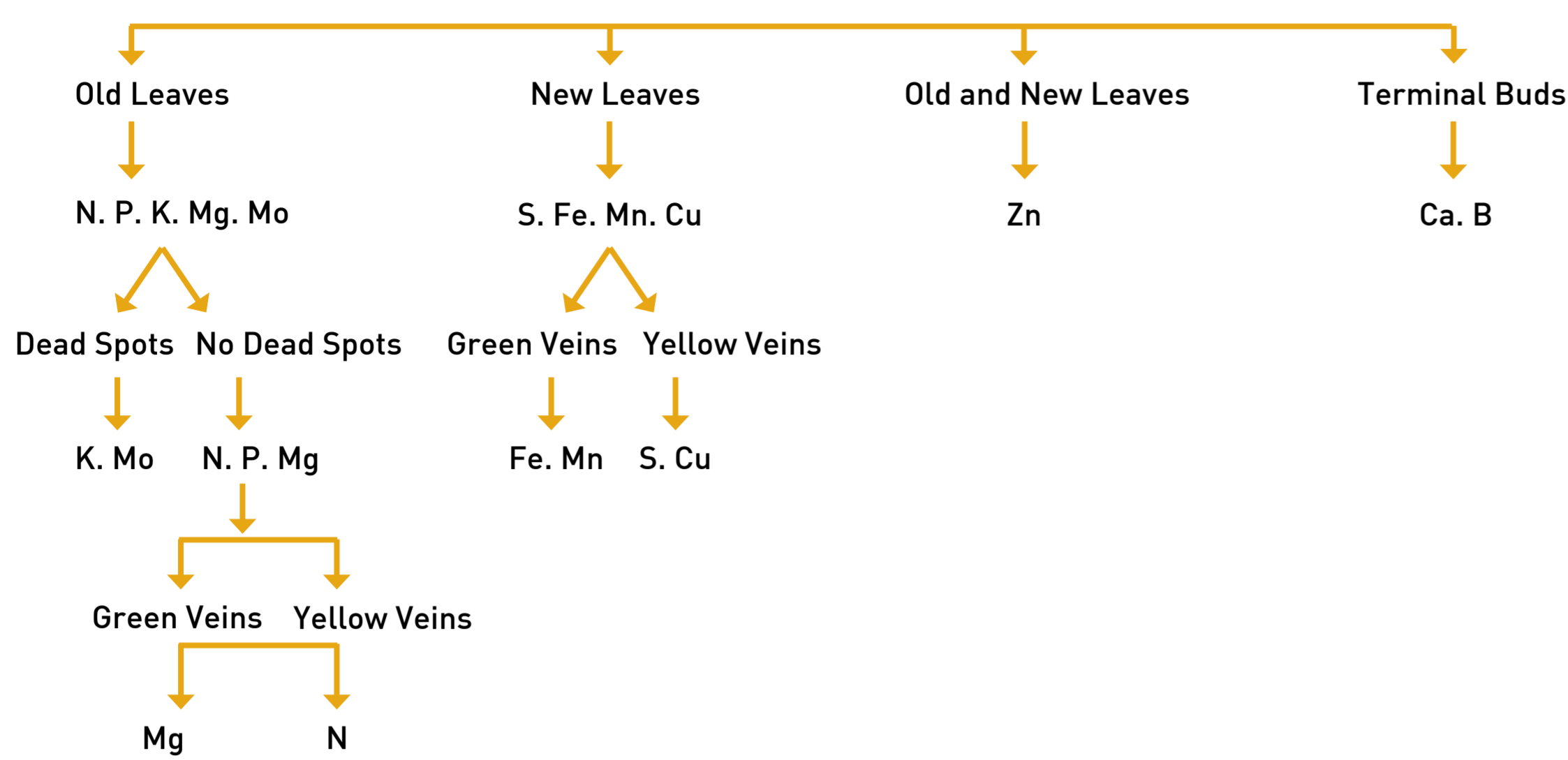


Capsicum

Nutrient Deficiencies & Toxicities

NUTRIENT DEFICIENCY IDENTIFICATION KEY (6. Source - Reddy)



Growers need to be aware that there are limitations to the identification of nutrient deficiency and toxicity in plants:

- Hidden hunger; where a plant's production is limited by nutrient deficiency/ies that are not exhibited visually, can be as high as 35%
- Multiple nutrient deficiencies; if the crop has multiple deficiencies or toxicities then the visual expression of this can be misleading and result in incorrect diagnosis
- Pests and diseases; the damage to crops form a range of pests and diseases can look very similar to nutrient deficiencies and toxicities

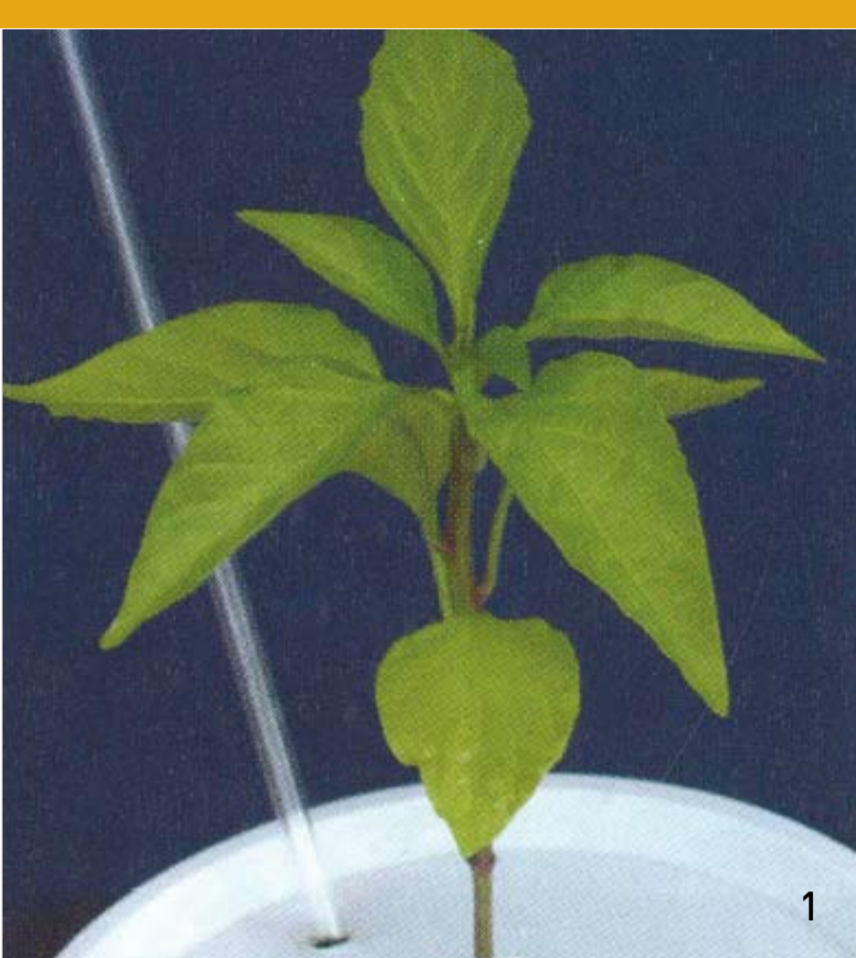
If growers suspect nutrient disorders in crops then the correct action will be to undertake a plant tissue analysis through an accredited laboratory and then seek professional advice. For Capsicum: from 4 weeks after planting, taking the youngest fully developed leaf

Definition: Chlorosis - Yellowing or whitening of leaf tissue
Necrosis - Browning and or dying of leaf tissue

Image sources identified by number on image:

1. J.L. Gibson, D.S. Pitchay, A.L. Williams-Rhodes, B.E. Whipker, P.V. Nelson and J.M. Dole. 2007. Nutrient Deficiencies in Bedding Plants: A Pictorial Guide for Identification and Correction. Ball Publishing, Batavia, Illinois USA.
2. DPI NSW
3. R.G. Weir and G.C. Cresswell. 1993. Plant Nutrient Disorders 3. Vegetable Crops. Inkata Press, Australia.
4. Haifa. http://www.haifa-group.com/knowledge_center/crop_guides/pepper/nutritional_requirements/nutritional_disorders_in_peppers/
5. Plant Nutrition. South China Agricultural University. <http://jpkc.scau.edu.cn/plantnutrition/pic/class.asp?classid=43>
6. Reddy, T.Y. and Reddi, G.H.S. 1997. Mineral nutrition, manures and fertilizers. In Principles of Agronomy. pp. 204-256. Kalyani Publishers, Ludhiana, India.

MACRONUTRIENT DEFICIENCY

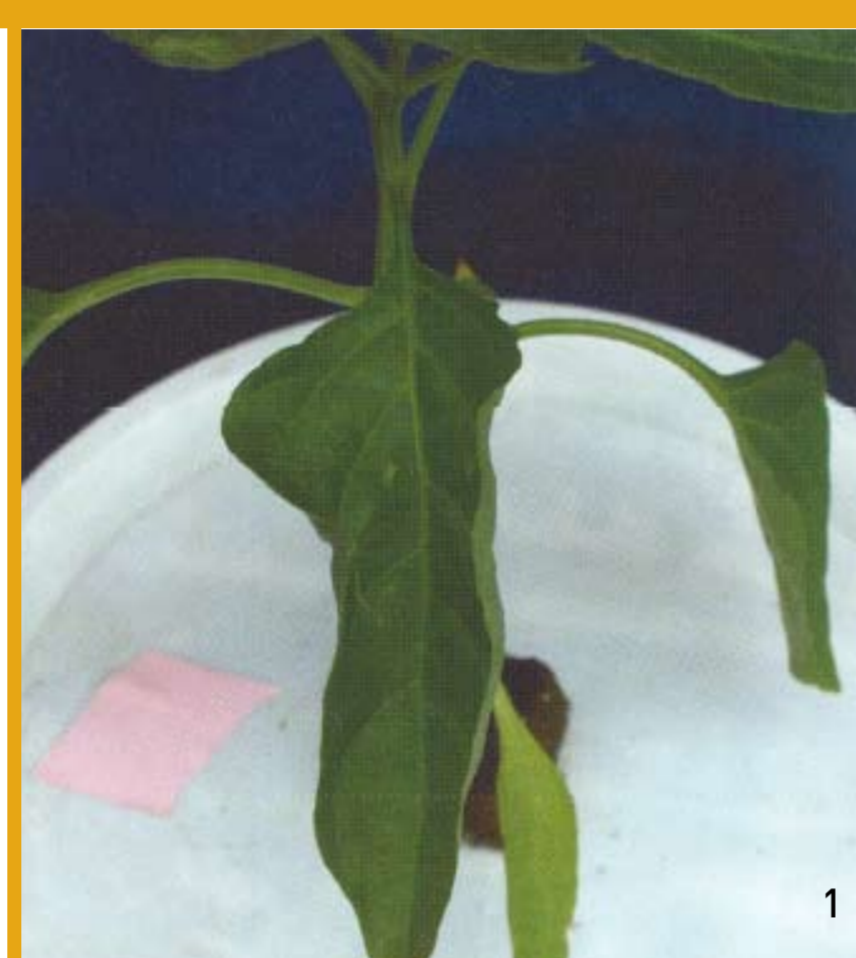


Nitrogen (N)

Symptoms

- Reduced growth, smaller leaves and fruits than normal
- General yellowing of leaves and reduction of green colour of fruit
- Deficiency observed in older leaves first

Desired Nutrient Level
3.0-5.0%

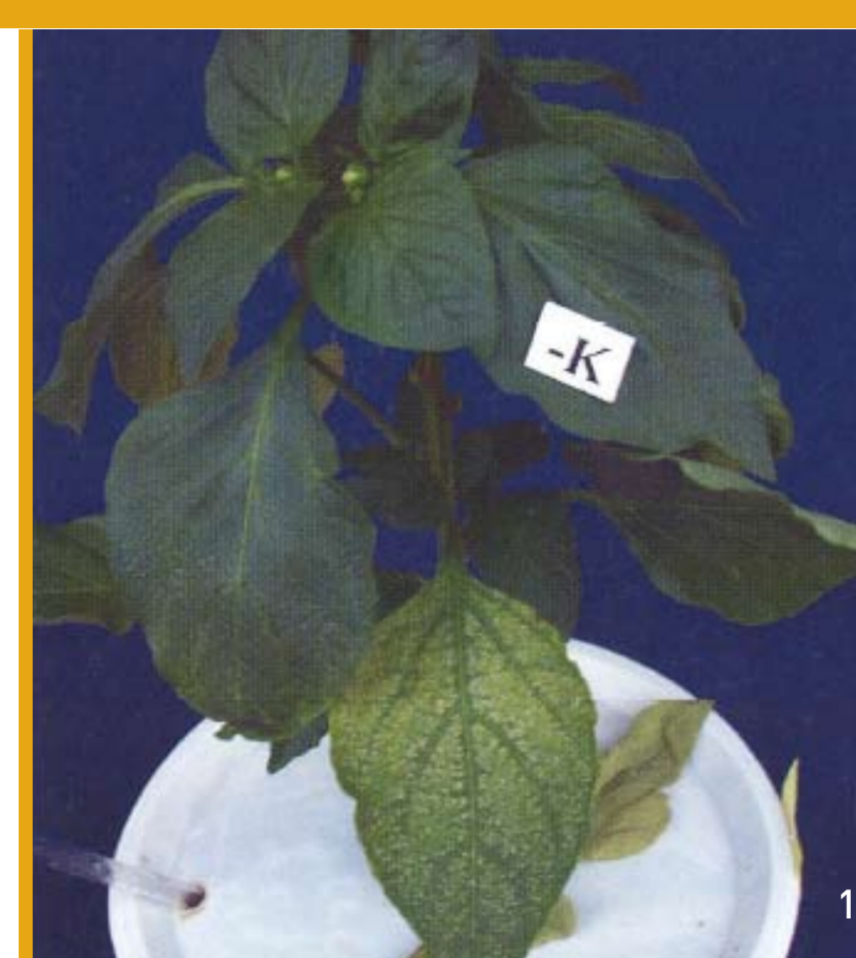


Phosphorus (P)

Symptoms

- Deficiency is rare in commercial pepper crops
- Reduced plant growth and leaves are smaller and darker green than normal
- Deficiency occurs in older leaves first

Desired Nutrient Level
0.3-0.7%



Potassium (K)

Symptoms

- Leaf bronzing.
- Older leaves turn tan and then brown at the margins.
- Plants under K stress are smaller than normal and produce fewer and smaller fruit with thinner walls.
- Deficiency is observed in lower leaves first and advances to the middle leaves

Desired Nutrient Level
3.0-5.5%



Sulfur (S)

Symptoms

- Plants develop chlorosis of the shoot tip as a light green colour progressing down the plant
- Small necrotic spots can develop on the tips and margins of the young and recently mature leaves
- Plants with advanced deficiency will be stunted, upper chlorotic foliage turns light yellow to white

Desired Nutrient Level
no data available



Calcium (Ca)

Symptoms

- Deficiency leads to blossom-end rot
- Sunken, dark lesion develops at the distal end of the fruit.
- Young developing fruit is most vulnerable to Ca deficiency.
- Stunting and necrosis of the youngest leaves and growing points occurs at the top of the plant.
- Excessive N increases the risk of blossom-end rot

Desired Nutrient Level
1-3.5%



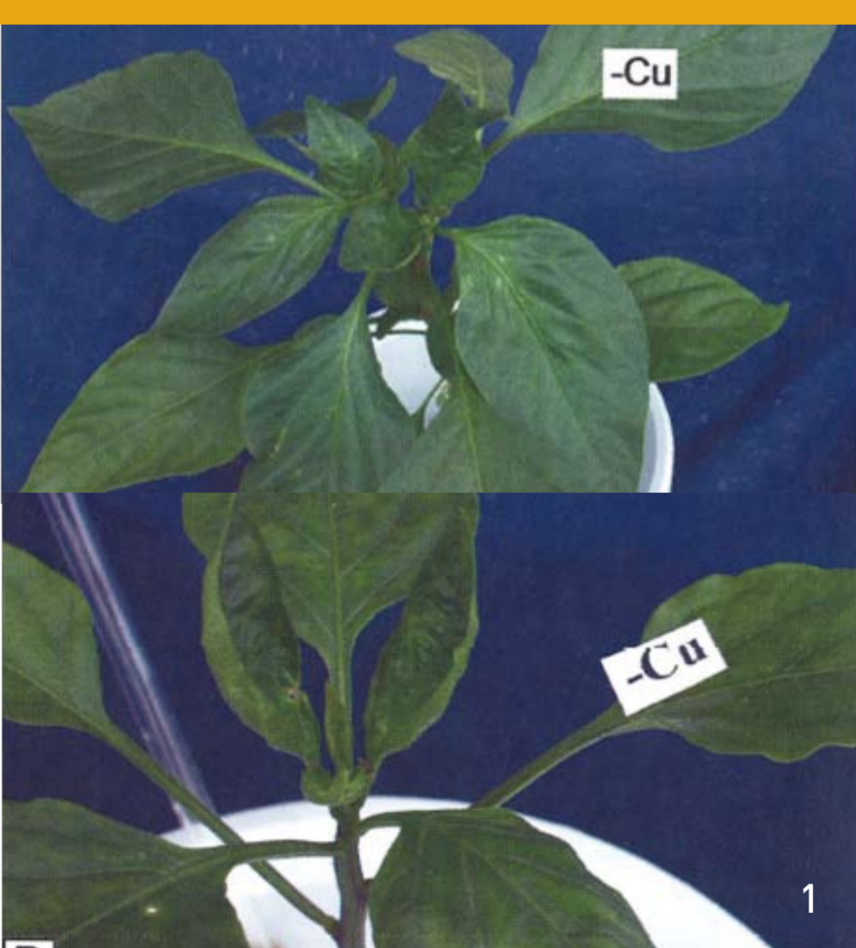
Magnesium (Mg)

Symptoms

- Deficiency is occasionally observed in commercial pepper crops.
- Marked interveinal chlorosis (appears almost white)
- Develops on the older leaves and then the middle-aged leaves

Desired Nutrient Level
0.3-1.2%

MICRONUTRIENT DEFICIENCY



Copper (Cu)

Symptoms

- Deficiency initially develops as a faint interveinal chlorosis of the young to recently mature leaves
- Young leaves begin to roll up at the margin
- Advanced symptoms develop as a severe rolling of the young leaves, gives a cupped appearance

Desired Nutrient Level
6-200mg/kg (ppm)



Zinc (Zn)

Symptoms

- Deficiency appears as small thickened young leaves that are deformed
- Faint interveinal chlorosis and large brown necrotic patches develop on the recently mature to mature leaves in the advanced stage

Desired Nutrient Level
20-200mg/kg (ppm)



Manganese (Mn)

Symptoms

- Deficiency occurs under conditions similar to those associated with Fe deficiency.
- Interveinal chlorosis or speckling of the young, expanding leaves

Desired Nutrient Level
50-250mg/kg (ppm)

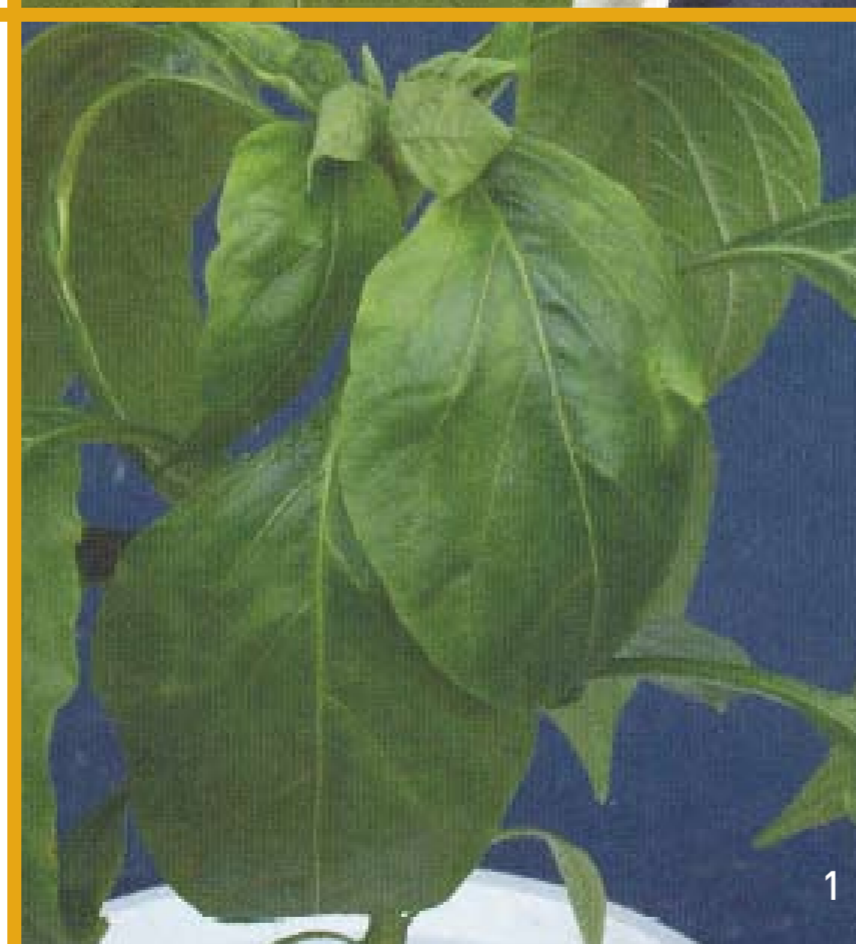


Iron (Fe)

Symptoms

- Deficiency occurs in the youngest expanding leaves at the tips of the branches
- Most often observed in crops growing in alkaline soils (pH → 7.0)

Desired Nutrient Level
60-300mg/kg (ppm)



Boron (B)

Symptoms

- Plants are stunted or dwarfed
- Deformed young leaves with necrosis
- Limited budding or death of buds
- Low fruit set, small deformed fruit

Desired Nutrient Level
30-100mg/kg (ppm)



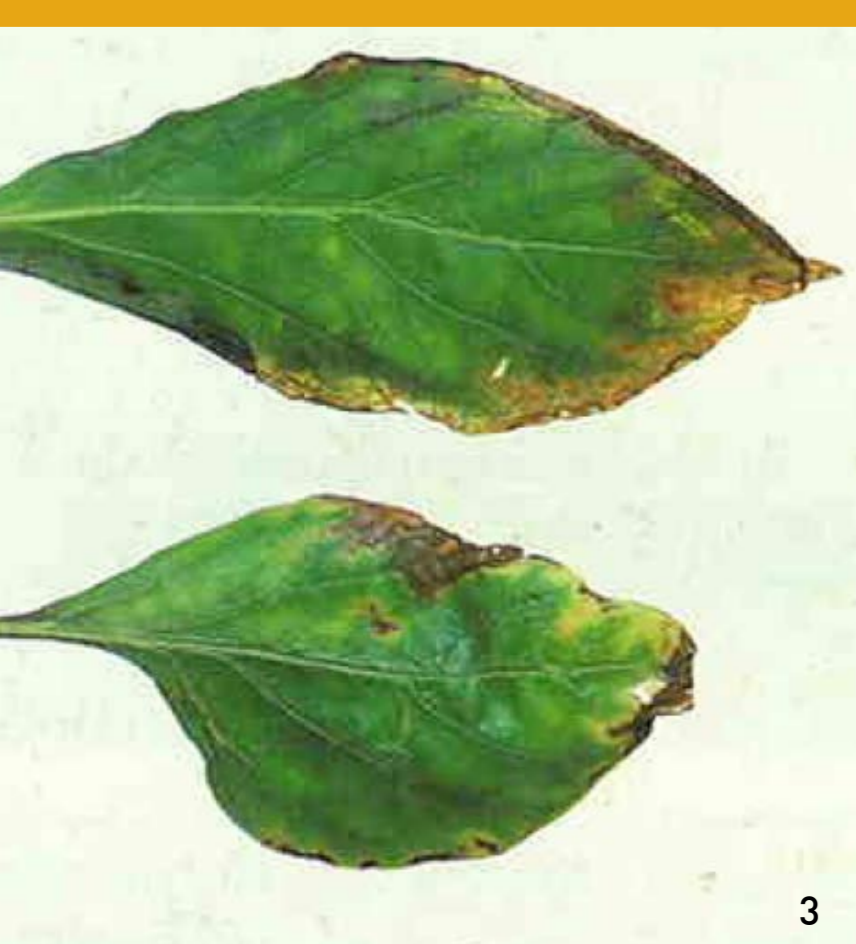
Molybdenum (Mo)

Symptoms

- Plants stunted and pale
- Often show similar symptoms to nitrogen deficiency
- May have marginal necrosis

Desired Nutrient Level
0.3-2.0mg/kg (ppm)

TOXICITY



Sodium (Na) & Chloride (Cl)

Symptoms

- Burning of the leaf tip and yellowing or scorching of the margins are the most common symptoms for chloride toxicity
- Older leaves always show the symptoms first

Desired Nutrient Level
0-1.6% (Chloride)
0-0.3% (Sodium)



Boron (B)

Symptoms

- Show first on older leaves as a yellowing, interveinal chlorosis,
- Spotting, or drying of leaf tissue at the tips and edges

Desired Nutrient Level
30-100mg/kg (ppm)



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Department of Primary Industries



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