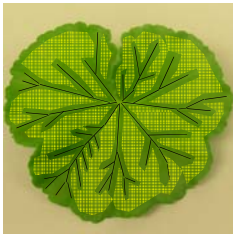
Terminology for Diagnosing Nutrient Deficiencies

Categorizing Symptoms: Terminology

- Chlorosis
  - Interveinal
  - Marginal
  - Leaf Base
  - General
- Necrosis
  - Marginal
  - Internal
- Distortion
  - Waffle
  - Curling + death
  - Thickening



Chlorosis: Interveinal

Iron deficiency is the classic example of interveinal chlorosis

Begonia

Petunia

Early iron deficiency in geranium

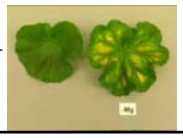
Chlorosis: Interveinal

Some early deficiency symptoms can evolve into interveinal chlorosis

Advanced Zn deficiency in geranium

Severe Zn deficiency

Early Mg deficiency in geranium



Advanced Mg deficiency

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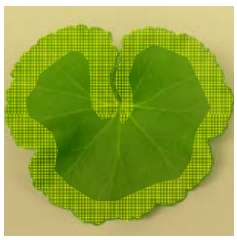

Chlorosis: Marginal

Phosphorus deficiency is the classic example of marginal chlorosis

Chlorosis: Marginal

Dark foliage can make "chlorosis" identification difficult

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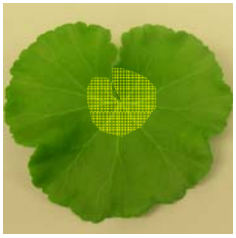
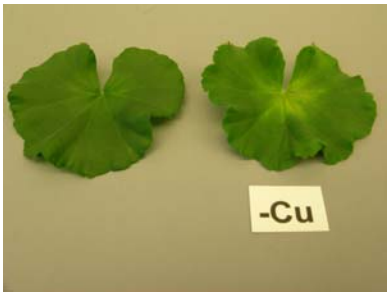


Chlorosis: Leaf Base

Copper deficiency often begins at the leaf base and progresses towards the margin



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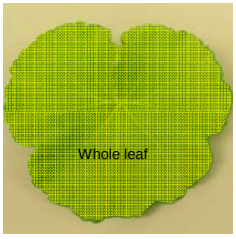
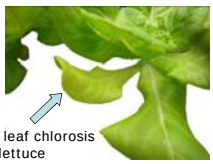
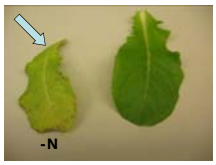


Chlorosis: General

No distinct pattern. Compare leaves on the same plant to see the difference in color



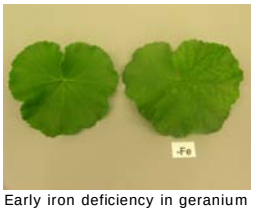
Lower leaf chlorosis in –N lettuce



Advanced S deficiency in geranium

Chlorosis: General

Some early deficiency symptoms can evolve into general chlorosis



Early iron deficiency in geranium

Advanced iron deficiency

Necrosis: Marginal

Unfortunately, some deficiency symptoms first appear as necrosis (dead tissue). Potassium will appear suddenly as marginal necrotic zones.

Necrosis: Marginal

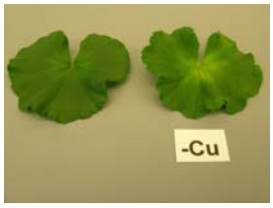
Some marginal deficiency symptoms that were "chlorotic" can evolve into "necrotic" regions

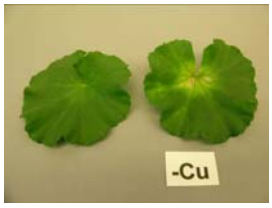
Advanced phosphorus deficiency in geranium

Severe phosphorus deficiency

Necrosis: Internal

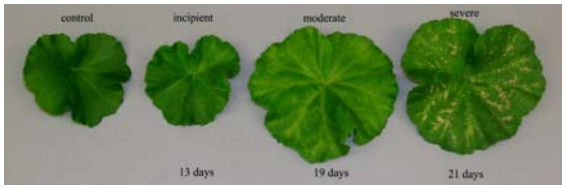
Most often, internal necrotic regions were areas that evolved from chlorotic zones as the symptoms became more severe.





Necrosis: Internal

Sometimes, the progression from early symptoms to severe, unfixable necrotic symptoms can be devastatingly rapid



Boron deficiency in geranium began as veinal chlorosis but quickly developed into large areas of necrosis

Distortion: Waffle

Photos from Dr. Brian Whipker, North Carolina State University

High electrical conductivity can cause leaf morphology to change. New Guinea impatiens readily exhibit high EC symptoms. Plant growth can also be stunted.

Distortion: Curling and Death

Photos from Dr. Brian Whipker, North Carolina State University

Top leaf curl symptoms are commonly associated with B and Ca deficiencies.

Distortion: Thickening

Thickening is often seen with boron deficiency and toxicity. Leaves will often appear glossy and are extremely brittle.

Normal lettuce plants

-B lettuce, note shiny, warped leaves

Distortion: Thickening

Thickening is often seed with boron deficiency and toxicity. Leaves will often appear glossy

Boron toxicity in fuschia