e-GRO Alert


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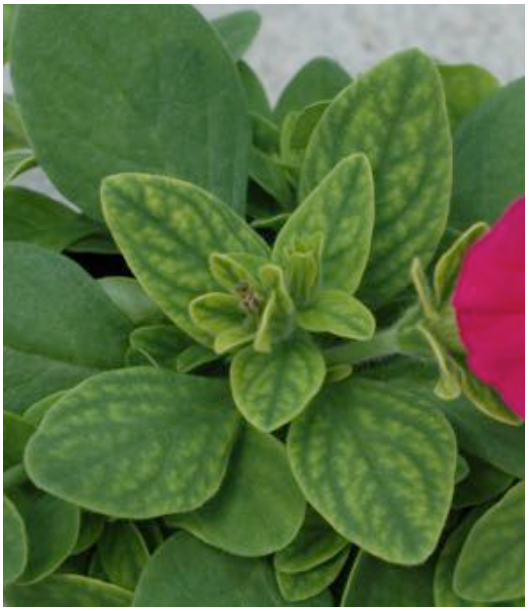
Ironing Out: Problems in a Petunia Crop

Interveinal chlorosis of the upper foliage is a common problem in petunia production. However, this can be a result of many factors including insufficient iron fertility, high pH, and overwater resulting in iron deficiency symptoms.

In greenhouse production interveinal chlorosis of the upper foliage is commonly associated with iron (Fe) deficiency (Fig. 1). Iron deficiency is initially observed as a light green coloration of the new upper foliage, progressing to more pronounced interveinal chlorosis and finally, in severe cases, total yellowing and bleaching of the foliage (Fig. 2). However, there is a wide range of causes for Fe deficiency including insufficient Fe fertility, high substrate pH, or overwatering. While these can be common problems in greenhouse production, determining why Fe deficiency is occurring is critical for attractive plants (see alert 8.24 for additional information on determining Fe deficiency causes).



igure 1: Interveinal chlorosis (yellowing) occurs when iron (Fe) uptake is inadequate for the plant's needs. There are a multitude of reasons why this can occur, and determining the reason is key to managing the situation. (Photo: Brian Whipker)

In a commercial greenhouse operation, we observed petunias (*Petunia x atkinsiana*) with a wide range of Fe deficiency symptoms. Petunias can be classified as high pH sensitive crops, when the substrate pH is > 6.4, Fe deficiency symptoms can commonly be observed. Petunias have an optimal pH range of 5.5 – 6.2 outside of which plants will struggle. At higher substrate pH levels nutrients such as Fe, manganese (Mn), zinc (Zn),

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and copper (Cu) become less available to the plant. In most cases, plants with abnormally high pH values will experience Fe-deficiency symptoms first. Iron is an immobile element in the plant and as a result, cannot be translocated from lower foliage to meet the plants' needs in the newly developing portions of the plant. While interveinal chlorosis of the upper is commonly attributed to Fe deficiency, however less common similar symptoms may be observed with manganese (Mn) deficiency. Foliar tissue analysis should be used to determine if the observed symptoms are caused by Fe, Mn, or both. If the substrate is continually wet, growers should reduce watering frequency or increase aggregate percentages in their substrate to facilitate drainage.

Ways to correct Fe deficiency:

Iron Drench If the levels are excessively high, then an Fe chelate application can be made to the substrate. Below are the options. Iron Chelate Drench (options)

- Iron-EDDHA: Mix 5 ounces in 100 gallons of water
- Iron-DTPA: Mix 5 ounces in 100 gallons of water
- Iron sulfate: Mix 4-8 ounces in 100 gallons of water
- Apply as a substrate drench with sufficient volume to leach the pot.
- Rinse foliage immediately.

Summary:

Iron chlorosis can be a challenge for growers due to the wide array of causes. Monitoring substrate pH, automated irrigation, and micronutrient supply is crucial to preventing a wide array of problems including iron chlorosis. Ensuring that automated irrigation is tailored to the weather conditions as seasonal weather shifts is a crucial step in preventing overwatering. Additionally, monitoring substrate pH to ensure that the substrate pH does not increase greater than 6.4 to prevent Fe deficiency for high pH-sensitive plants.

Figure 2. The progression of insufficient levels of iron (Fe)-induced interveinal chlorosis (yellowing) on petunia plants. (Photo: Brian Whipker)

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