e-GRO Alert

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Ironing Out Problems in Pansies

Interveinal chlorosis of the upper foliage is a common problem in pansy 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 (Figs. 1&2). Iron deficiency is initially commonly observed as a light green coloration of the new upper foliage, progressing to more pronounced interveinal chlorosis (Figs. 3&4) and finally, in severe cases, total yellowing and bleaching of the foliage (Fig. 5). However, there is a wide range of causes for Fe deficiency including insufficient Fe fertility, high substrate pH, or overwatering. If only a few scattered plants are infected, then inspect the roots for root rot. 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).

Figure 1. Initial signs of an iron deficiency problem. (Photo: Brian Whipker)

In a commercial greenhouse operation, we observed pansies (*Viola* × *wittrockiana*) with a wide range of Fe deficiency symptoms. Pansies can be classified as high pH sensitive crops, when the substrate pH is >6.4, Fe deficiency symptoms can commonly be observed. Pansies have an optimal pH range of 5.5 – 6.2 outside of which plants will

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struggle. At higher substrate pH levels nutrients such as Fe, manganese (Mn), zinc (Zn), 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 application can be made to the substrate. Iron chelates are preferred to an iron sulfate application. Below are the options for iron drenches.

- 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.

Figure 2. Interveinal chlorosis of the upper foliage due to an elevated substrate pH. (Photo: Brian Whipker)

Figure 3. Intermediate interveinal chlorosis due to elevated substrate pH levels. (Photo: Brian Whipker)

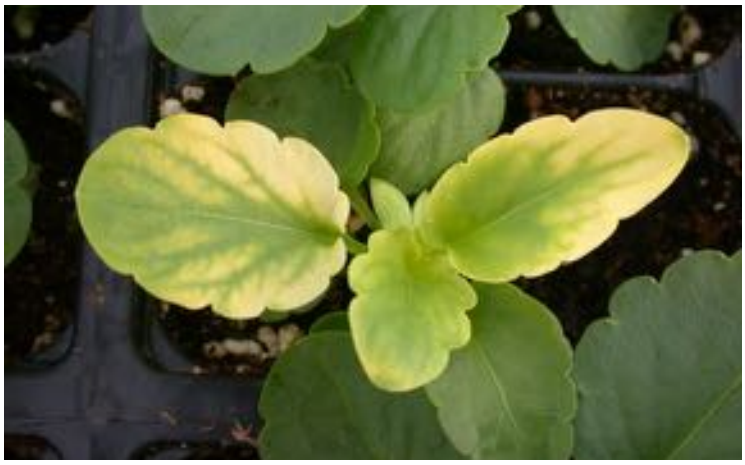

Figure 4. Distinctive interveinal chlorosis symptoms due to an elevated substrate pH. (Photo: Brian Whipker)

Figure 5. Advanced symptoms of leaf bleaching due to an iron deficiency induced by excessive high substrate pH levels. (Photos: Brian Whipker)

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.

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