e-GRO Alert

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Troubleshooting Ipomoea

Warm season annuals such as ipomoea can be challenged with cloudy weather.

This spring has been a mixed bag of weather. Days of rain and cloudy overcast skies negatively effect plant growth of warm season species such as ipomoea. In addition, greenhouse temperatures are often "averaged" to try to make most of the wide array of species being grown in a greenhouse happy. With ipomoea preferring a warmer environment, cooler growing temperatures can lead to stalled growth. This Alert focuses on some of the nutritional and growth issues that can occur with ipomoea when growing conditions are not optimal.

Figure 1. Initial symptom of nitrogen deficiency of ipomoea with lower leaves becoming pale green and then yellow. (Photo: Brian Whipker)

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Nitrogen and Electrical Conductivity (EC)

Irrigation needs are less during cloudy weather. This affects the total delivery of nutrients to plants. If in a normal spring you are irrigating twice a week with a 150 ppm nitrogen (N) solution and providing 500 ml of irrigation solution to a plant, that means a plant will receive 1 liter of water and a total of 150 mg N per week. If under cloudy conditions the plants are only being irrigated once a week, then the amount of N delivered to the plant is only half at 75 mg N. This can lead to the onset of N deficiency symptoms which manifest on the lower leaves as an overall pale green to yellow, and ultimately necrotic leaves (Fig. 1, 2, and 3).

Monitoring the pH and EC will help ensure that the nutritional needs of ipomoea are being met. The target pH is between 5.5 and 6.2 and the target PourThru EC is 2.0 to 3.0 mS/cm for actively growing plants. See FertDirtandSquirt 3.12 for more details about the nutritional needs of ipomoea.

If this problem occurs each year, a simple solution is to provide a supplemental slow-release fertilizer application to ipomoea. This works especially well for most greenhouses that have multiple species in a single greenhouse range and only one injector per house.

If a corrective fertilizer application is needed to counteract nutrient problems, one or two doses of 300 ppm N should replenish nutrient levels.

Figure 2. Intermediate symptoms of lower leaf yellowing due to a nitrogen deficiency of ipomoea. (Photo: Brian Whipker)

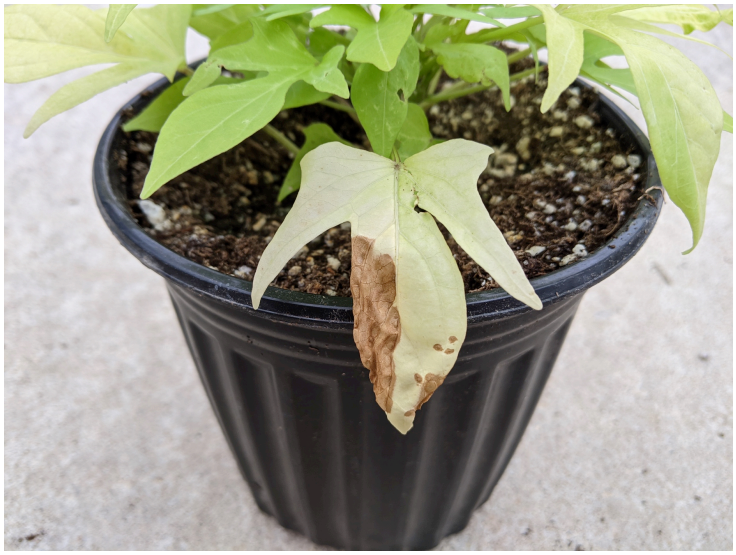

Figure 3. Advanced symptoms of lower leaf necrosis due to a nitrogen deficiency of ipomoea. (Photo: Brian Whipker)

Magnesium (Mg)

Symptomology of Mg deficiency occurs on the lower, older leaves. That is because Mg is a mobile element, and if Mg is limit in the plant, it will be translocated to the new tissue if required. Typical symptomology is lower leaf interveinal chlorosis (yellowing) in chartreuse-leaf ipomoea cultivars (Fig. 4).

In many areas, adequate Mg is available in the groundwater used for irrigation. Concentrations of 25 to 50 ppm Mg are often available and provide adequate levels for plant growth. In addition, supplemental Mg is also supplied via the dolomitic limestone used to adjust the substrate pH. But not all growing locations have irrigation water that provides a supply of Mg.

The correction for a Mg deficiency is easy. Applying Epsom salts (magnesium sulfate) at the rate of 2 pounds per 100 gallons of water (2.4 kg/1000L). Apply this as a 10% flow through leaching irrigation. This will stop the progression of symptoms, but will not reverse any advanced interveinal chlorosis or necrotic spotting. For areas that lack sufficient Mg in their irrigation water and Mg is not part of the regular fertilization program (ie: 20-10-20 does NOT contain Mg), monthly applications of Epsom salts at the rate of 1 pound per 100 gallons of water (1.2 kg/1000L) is the common production practice to green up plants and avoid deficiencies.

Distorted Growth – Three Possibilities

Distorted new growth can be associated with a deficiency of boron or calcium. Yet these deficiencies are rare in ipomoea. A more probable cause is **Western flower thrips** (*Frankliniella occidentalis*) feeding. We have been amazed at the degree of damage that a single thrips can do to an ipomoea plant. That is because thrips have a thigmotactic feeding behavior, which means they prefer to feed in tight, secure locations such as a growing tip of ipomoea or in a flower bud. Thus in only a short amount of time, their rasping-sucking feeding style of piercing a plant cell and sucking up the contents can inflict cell damage and death, which later expands out to a significant visual problem as the leaf unfolds and matures (Fig. 5). See e-GRO Alert 5.28 for additional details about Western flower thrips and their control.

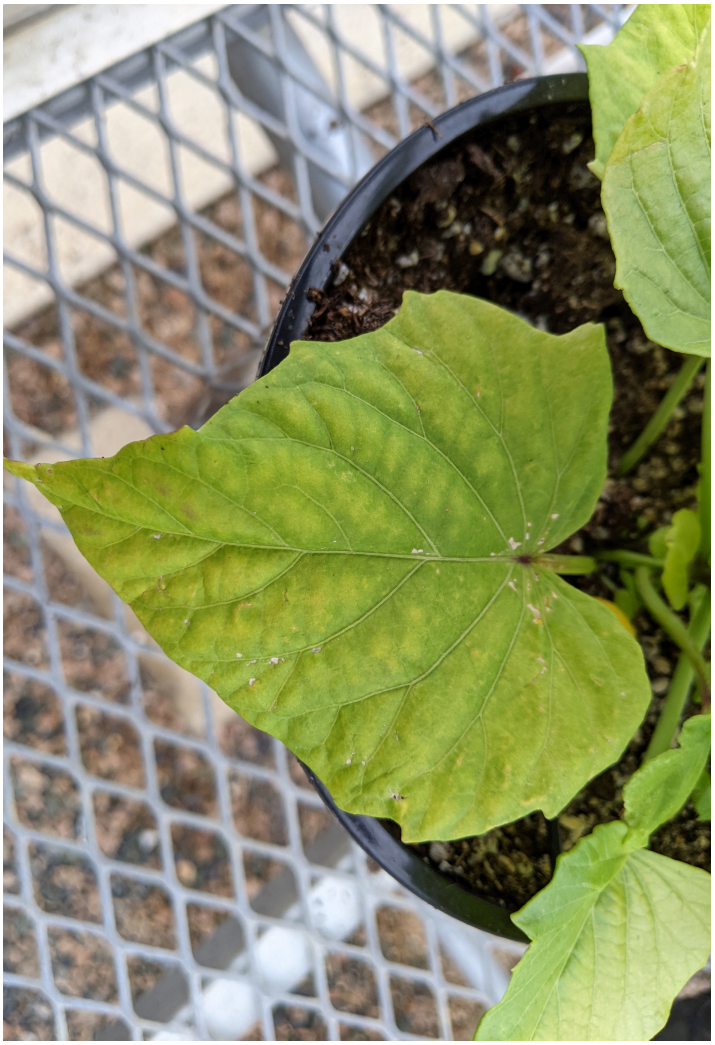

Figure 4. Typical symptomology of a magnesium deficiency is interveinal chlorosis (yellowing) of the lower leaves. (Photo: Brian Whipker)

In prior e-GRO Alerts, we have discussed distorted tip growth (Fig. 6) associated with **broad mite** damage (Alert 5.23). This type of damage may make one think that boron is deficient or herbicide drift has occurred. Broad mites are tiny and a 100X microscope is required to view them. Submit a sample to a diagnostic lab to obtain a confriming diagnosis.

In addition, odd growth on the top of the leaf due to **intumescence** (edema) can also be an issue with ipomoea (Fig. 7). Read e-GRO Alerts 6.12 and 8.26 for additional details.

Overall, ipomoea are easy plants to grow. They prefer warmer temperatures and lots of sun. These conditions will help avoid many nutritional issues that might occur during cloudy weather.

Figure 5. Distorted new growth due to Western flower thrips feeding. (Photo: Brian Whipker)

Figure 6. Distorted growing tips due to a broad mite infestation. (Photo: Brian Whipker)

Figure 7. Intumescence (edema) can occur which results in bumps being formed on the leaf surface. (Photo: Brian Whipker)

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