

Dragon Wing Begonia: Lower Leaf Necrotic Spots

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The reason behind lower leaf necrotic spotting of Dragon Wing begonias is discussed.

Dragon Wing® begonias (*Begonia x hybrida*) are attractive plants which perform well in North Carolina landscapes. They are grown by many operations and because of this we commonly scout plants for any disorders. Dragon Wing begonias are fairly pest free, but one disorder that we have observed in greenhouses is lower leaf necrotic spots (Figure 1). Necrotic leaf spots have not been reported. So we investigated to determine the cause.

Symptoms

The initial symptoms begin as small, chlorotic spotting between the veins of the lower leaves (Figure 2). The yellow spots quickly develop into brownish-black necrotic spots (Figure 3). With advanced symptoms, a ne-

crotic band develops along the leaf margins (Figures 4&5).

To determine the cause of the spotting, we conducted PourThru pH and EC testing. PanAmerican Seed company recommends maintaining the pH between 5.4

and 6.0. In two grower situations the pH values were both at 5.1. The PourThru EC values were around 1.5 mS/cm (or 1.0 mS/cm when converted to the SME scale) which was within the recommended range. We also followed up with leaf tissue samples



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Figure 1. Lower leaf necrosis due to low substrate pH levels.



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Figure 2. Bronzing of the lower foliage due to low substrate pH.

to the North Carolina Department of Agriculture Soil Testing Lab to determine nutrient levels (Table 1).

Based on the fact that the substrate pH was low at 5.1 and the results of the leaf tissue analysis, the problem can be attributed to a low substrate pH induced iron and manganese toxicity. At low

substrate pHs, manganese and iron are more easily taken up by the plant and accumulates in the tissue until it turns necrotic. Iron levels were over twice as high in the symptomatic plant, while manganese levels were 3X higher (Table 1).

Management

The pH needs to be monitored



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Figure 3. Advancement of leaf necrosis and marginal leaf burn due to low substrate pH.

and controlled for optimal growth. There are a few ways to improve and correct the pH. One option available is using a basic fertilizer such as dark weather feed. Monitor the pH every two weeks to ensure that the pH is within the target range of 5.4 to 6.0.

If the pH drops too low, flowable lime at the rate of 2 quarts per 100 gallons of water will increase the substrate pH by half a unit. Repeat applications may be required. Monitor the pH within a few days of the application to make sure the pH has returned to the optimal range.

Additional Resources

PanAmerican Seed has a Grower Facts sheet on growing Dragon Wing Begonias. Access it from the following website. http://www.panamseed.com/series_info.aspx?phid=009202294004463

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Figure 4. Advanced leaf necrosis due to low substrate pH.

Table 1. Leaf tissue analysis results.		
Element	Normal Plant	Symptomatic Plant
Nitrogen (%)	4.42	4.04
Phosphorus (%)	0.35	0.47
Potassium (%)	2.15	3.98
Calcium (%)	1.13	1.69
Magnesium (%)	0.87	1.34
Sulfur (%)	0.27	0.28
Iron (ppm)	787	1870
Manganese (ppm)	193	618
Zinc (ppm)	48.9	53.4
Copper (ppm)	12.7	16.9
Boron (ppm)	53.1	66.1



Figure 5. Advanced leaf necrosis due to low substrate pH.