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Hungry Gerberas: A Multitude of Symptoms

Diagnosing gerbera with pale-green lower leaves, lower leaf purpling, and interveinal chlorosis of the upper and lower leaves.

Diagnosing nutritional issues starts with the location on the plant to aid in determining the problem. When a plant has a rosette growth pattern, such as with gerbera (Fig. 1), it can be trickier due to the overlapping leaves. In scouting a gerbera crop, we experienced a multitude of symptoms and relied upon PourThru pH and EC readings and leaf tissue analysis sampling to determine the situation.

Figure 1. The rosette leaf orientation of gerbera makes it more challenging to determine where the symptomology is occurring. (© Brian Whipker)

One type of symptom was lower leaf purpling (Fig. 2), which is typically associated with limited phosphorus (P). Another symptom was a general, overall pale green to light yellow discoloration of the lower leaves (Fig. 3), which can be associated with low electrical conductivity (EC) and nitrogen (N) deficiency. Gerbera commonly develops interveinal chlorosis of both the lower leaves [a magnesium (Mg) problem] (Fig. 4) or upper foliage [an iron (Fe) deficiency situation] (Fig. 5).

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Test Results

PourThru values are reported in Figures 2 to 5. The values found on the problematic plants were low at pH 5.2 and 5.4, but no symptoms of iron/manganese toxicity were observed. The target pH recommended by Fertdirtandsquirt is 5.8 to 6.2 for gerbera to avoid both low substrate-induced pH iron/manganese toxicity or iron deficiency when the pH is elevated.

The PourThru EC readings were low in three of the samples (0.20 and 0.22 mS/cm for the “Suspected Low EC and P-Deficient” plants), and 0.50 mS/cm for the “Suspected Mg-Deficient” situation. The PourThru EC values were below the range of 2.0-3.0 mS/cm for top irrigated plants as listed on the Fertdirtandsquirt website. These values support the diagnosis of overall low fertility, leading to the development of symptoms.

The “Suspected Fe-Deficient” plant data suggest a situation of limited nutrient uptake due to overwatering and poor roots when one considers the EC results of 1.63 mS/cm and the pH being low at 5.4 instead of being >6.5. Iron uptake is hindered by wet conditions, poor roots, and cold growing temperatures, besides when iron tie-up occurs at elevated pHs. It is always a good idea to inspect the root system to determine how healthy they are. In this case, the roots were not robust, and the shoot growth was also smaller. Both of these factors support the conclusion that an unhappy plant results in limited Fe uptake.

Figure 2. Lower leaf purpling is typical of a phosphorus deficiency. The PourThru pH was 5.2, and the EC was 0.22 mS/cm. (© Brian Whipker)

Figure 3. Pale green to yellow leaves are typical of a low fertility (EC) situation. The PourThru pH was 5.4, and the EC was 0.20 mS/cm. (© Brian Whipker)

We sampled the affected leaves to gain a better understanding of the nutrient concentrations and to determine if this would provide answers for interpreting the symptomology. The NCDA&CS lab results reported mostly low or deficient values in the plants (Table 1). The "Suspect P-Deficient" plants had the lowest P concentration at 0.05%. Overall, the nutrients were low in the "Suspected Low EC" plants with deficient concentrations of N, P, K, S, Zn, and B. These plants had slightly higher tissue nutrient concentrations than the "Suspect P-Deficient" plants, but did not have lower leaf purpling. The plants showing magnesium deficiency symptoms had the lowest leaf tissue Mg values. Finally, the "Suspected Fe-Deficient" plant had only slightly lower Fe leaf tissue concentration than the "Recommended Range" plants. Iron is sometimes difficult to diagnose based on leaf tissue values due to the Fe cellular tie-up and reduced leaf expansion, which results in higher leaf tissue values being reported.

Figure 4. Interveinal chlorosis of the lower leaves would suggest a magnesium deficiency. The PourThru pH was 5.2, and the EC was 0.50 mS/cm. (© Brian Whipker)

Figure 5. Interveinal chlorosis of the upper leaves commonly occurs when iron is limited. The PourThru pH was 5.4, and the EC was 1.63 mS/cm. (© Brian Whipker)

Conclusions

A number of factors need to be considered as a whole when diagnosing nutritional problems in plants. Combining knowledge of typical symptomology, PourThru pH and EC data, and leaf tissue analysis data all provide insight into the problem. Values may not be as definitive as one would desire to help make a decisive diagnosis. For instance, the "Suspected P-Deficient" and "Suspected Low EC" plants both have similar substrate pH and EC readings, and

Table 1. Leaf tissue analysis values for problematic gerbera[1].

Element	Suspected P Deficient	Suspected Low EC	Suspected Mg Deficient	Suspected Fe Deficient	Recommended Range[2]
Nitrogen %	0.84	0.91	1.85	3.19	3.71-4.97
Phosphorus %	**0.05**	0.06	0.11	0.24	0.33-0.54
Potassium %	0.78	0.89	1.75	2.89	2.05-3.27
Calcium %	0.55	0.55	0.65	0.89	0.84-1.28
Magnesium %	0.27	0.23	**0.21**	0.32	0.30-0.49
Sulfur %	0.05	0.05	0.10	0.21	0.23-0.31
Iron (ppm)	72.1	43.2	51.2	**67.4**	76.3-252.0
Manganese (ppm)	39.7	20.0	7.28	5.40	77.8-179.3
Zinc (ppm)	17.4	18.1	15.5	22.3	35.6-65.6
Copper (ppm)	1.75	1.47	1.92	2.37	3.8-9.3
Boron (ppm)	10.8	14.7	12.9	24.2	22.4-36.2

[1] Cell colors indicate if the values are classified as:

DEFICIENT, LOW, RECOMMENDED RANGE, HIGH, or EXCESSIVE.

[2] The Recommended Range is based on research supported by the Fred C. Gloeckner Foundation and AFE (Veazie et al., 2025).

also leaf tissue values. Yet, lower leaf purpling symptomology is being manifested on one plant, while the other plant has overall pale yellowish-green leaves. This variation may be explained by the fact that the bench contained a mixture of cultivars, and the symptomology may simply be a variation of a red-flowering cultivar having more anthocyanin production and hence more prone to developing lower leaf purpling than a yellow-flowering cultivar, which did not have purpling. So, diagnosing problems can be both an Art and a Science. As a grower, it is invaluable to know the basic nutritional disorder symptomology to help you in diagnosing problems.

References

Veazie, P., Chen, H., Hicks, K., & Whipker, B. (2025). Generating Gerbera Foliar Nutrient Interpretation Ranges with a Meta-analysis Sufficiency Range Approach. HortScience, 60(6), 861-865. https://www.doi.org/10.21273/HORTSCI18522-25

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