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## Ranunculus: Lower Leaf Yellowing and Necrosis

*Lower leaf marginal chlorosis and necrosis are the typical signs of a Mg deficiency. A potassium deficiency also has similar symptoms, but is relatively uncommon because abundant K is provided by most fertilizers. Learn how to recognize the symptoms of a K deficiency and take preventative and corrective actions.*

During a greenhouse visit, I was asked to look at some ranunculus (*Ranunculus asiaticus*) plants. They had lower leaf interveinal chlorosis (Fig. 1) and some marginal necrosis (Fig. 2&3). I initially suspected it to be a magnesium (Mg) deficiency. Magnesium deficiencies are common in the Southeast because the irrigation water is low in Mg. To confirm my diagnosis, I submitted a tissue sample to the North Carolina Department of Agriculture-Agronomic Testing Lab.

The results indicate that the common mimic of a Mg deficiency symptom



Figure 1. Ranunculus with interveinal chlorosis of the lower leaves.

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fooled me. The tissue contained adequate levels of Mg. Levels below 0.40% are generally considered deficient in most plants. (Note: tissue standards for normally growing ranunculus are not available.) What was limited in the tissue was potassium (K). Potassium was being supplied in the fertilizer program, but uptake problems may of occurred from too much calcium or magnesium being antagonistic for the plant to acquire K. Calcium tissue levels were on the high side. Another possibility is a higher demand of K occurs during flowering. Potassium is needed in larger quantities

by plants with extensive stem tissue. For instance, potted sunflowers have a very large demand for potassium and it is common to observe deficiencies. In *Floriculture Principles and Species* by J.M. Dole and H.F. Wilkins, a N:K ratio of 1.0 to 1.5 is recommended for ranunculus.

### **Corrective and Preventative Measures**

When growing ranunculus, make sure you supply potassium. Potassium nitrate is an excellent choice for increasing potassium levels. Just before flowering begins, consider submitting a substrate and tissue sample to a commercial lab



Figure 2. More advanced interveinal/marginal chlorosis of ranunculus.

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to determine if levels are adequate. Also avoid providing excessive amounts of calcium or magnesium that might limit the uptake of potassium.

Summary

In summary, potassium deficiencies are not overly

common in most greenhouse grown plants (Fig. 4). Deficiencies are more likely to occur with plants which have extensive stem tissue. Mg deficiencies also have similar symptoms. A tissue nutrient test will be needed to con-



Figure 3. Lower leaves with pronounced marginal chlorosis.

firm your diagnosis

Table 1. Leaf tissue nutrient analysis results for <i>Ranunculus asiaticus</i> .	
Element	Lower Leaves with Chlorotic and Necrotic Symptoms (Flowering Plants)
Nitrogen (%)	1.99
Phosphorus (%)	0.19
Potassium (%)	<b>0.86</b>
Calcium (%)	<b>2.72</b>
Magnesium (%)	1.17
Sulfur (%)	0.11
Sodium (%)	0.39
Iron (ppm)	151
Manganese (ppm)	65.9
Zinc (ppm)	102
Copper (ppm)	3.85
Boron (ppm)	35.9



Figure 4. *Ranunculus* plants were concurrently growing in the NC State University Nutrient Disorder System when this grower problem occurred. Potassium (K) deficiency symptoms were similar to what was observed with the grower sample. Also note that magnesium deficiency symptoms are also similar, therefore a tissue sample must be submitted to a commercial lab to accurately diagnose the problem.