e-GRO Nutritional Monitoring

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Nutritional Monitoring Series: Element Edition

Potassium (K)

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Function: Builds protein and involved with photosynthesis, fruit quality, stomata regulation, water uptake, and disease resistance.

Deficiency: Older leaves first develop chlorosis (yellowing) of interveinal areas, progressing to necrosis (browning; death) of the leaf margins (edges) (Figs. 1-3), and plants develop weak stems and

Figure 1. Lower leaf interveinal chlorosis and necrosis as the result of a potassium deficiency. Photo by: Brian Whipker.

Potassium

Elemental Parameters

Mobile Element:
Deficiency symptoms appear on older growth

Function:
Protein building, photosynthesis, stomata regulation

Target Fertilizer Range:
150 to 250 ppm K

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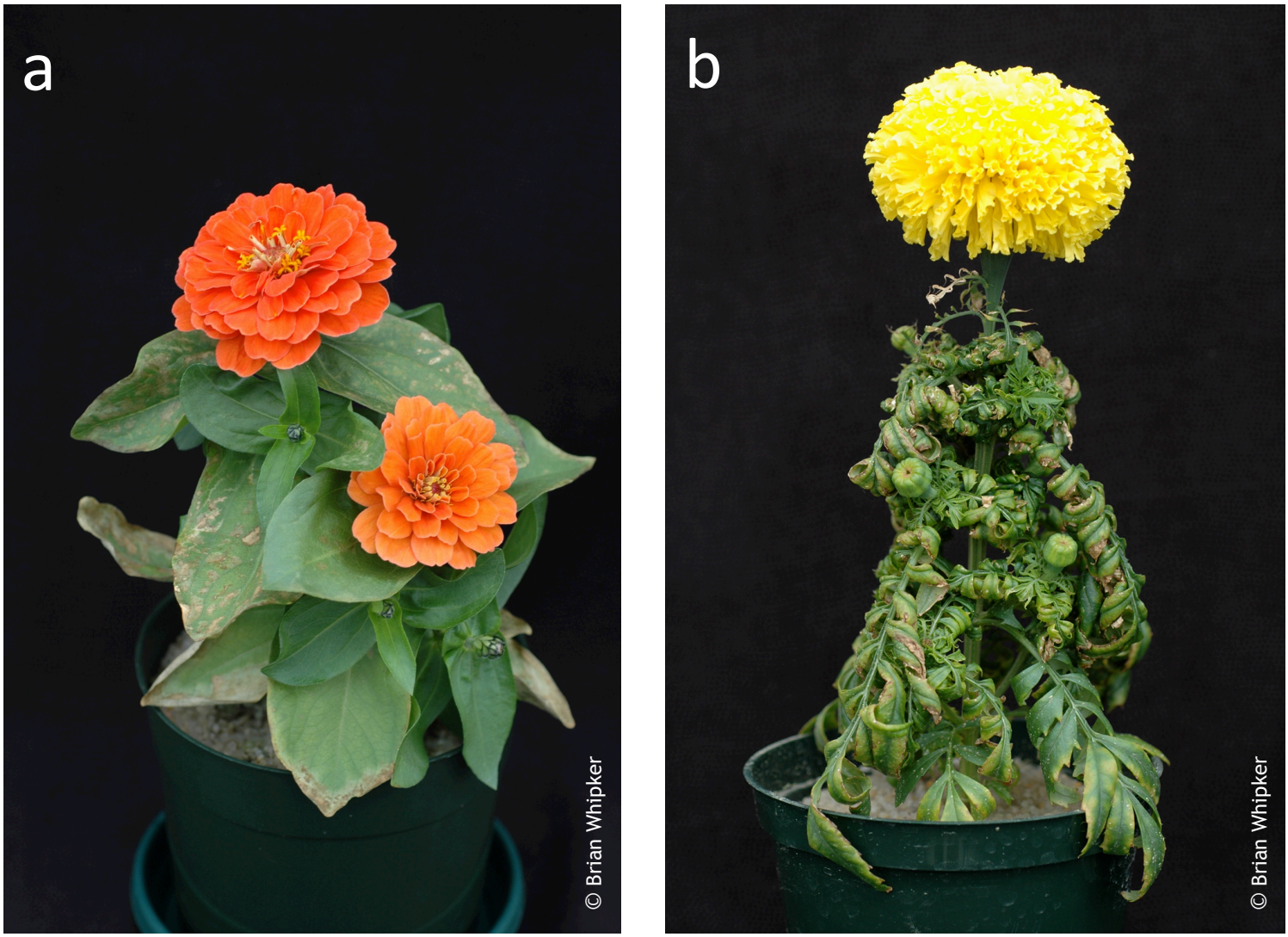

Figure 2. A potassium deficiency can result in (a) lower leaf leaf necrosis as seen here with zinnia and (b) with advanced development of symptoms a downward orientation of leaves as seen here with marigold. Photos by: Brian Whipker.

stalks. Potassium is a mobile element within the plant; therefore, deficiency symptoms will first appear on the lower, older leaves. Potassium deficiencies are not common.

Excess: Can reduce uptake of calcium (Ca), magnesium (Mg), manganese (Mn), ammoniacal-nitrogen (NH_4-N), or zinc (Zn).

Misdiagnosis With:

a. Magnesium deficiency also occurs on the lower leaves and can be confused with a K deficiency. Conduct a leaf tissue nutrient analysis to confirm.

Confirm your actual K levels by conducting a routine root substrate (medium) test and/or a plant tissue analysis.

Monitoring and Management Strategy for Potassium
Fertilization Rate: Provide or target 150 to 250 ppm constant liquid fertilization rate.

Ratio: Potassium fertilization rates >200 ppm K can have an antagonistic effect on Ca or Mg uptake by the plant. Supplying the plants with a K : Ca : Mg ratio (ppm) of 4 : 2 : 1 will limit any antagonisms.

Tissue Concentration: Normal K range of 1.5 to 3.5%. Potassium levels less than 1.0% are considered deficient in most species. Potassium concentrations greater than 4.0% are considered excessive, but are commonly reported with many floriculture species.

Figure 3. Lower leaf interveinal chlorosis and necrosis on petunia as the result of insufficient potassium. Photo by: Brian Whipker.

Options:

Preplant: Incorporation of potassium nitrate (KNO_3) into the root substrate (medium) for a starter charge.

Continual Fertilization:

1. Use a fertilizer that provides K. Examples include potassium nitrate (KNO_3), 20-10-20, 15-5-25, 13-2-13 Cal-Mag, 15-5-15 Cal-Mag, and others.

2. Remember when calculating K fertilization rates, the numbers on the fertilizer bag are expressed as a percent of K_2O. Therefore, multiply the bag number by 0.83 for the percentage of K. Example: 20-10-20 fertilizer would be calculated as 20 × 0.83 = 16.6% K.

Corrective Fertilization:

1.Applications include potassium nitrate (KNO_3) or 15-5-25 at the rate of 300 to 400 ppm K. One or two corrective K fertilizations will return the chlorotic tissue to the normal green color within 1 to 2 weeks. Do not overapply. It is important to correct K deficiency when symptoms first appear because necrotic leaf margins cannot be reversed.

e-GRO Alert

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