

## **Micronutrients:** 7 of them are essential for flowering plants:

1. **Boron (B):** sugar transport, regulates plant metabolism  
*Deficiency:* Bud dieback and failure of flower and leaf buds to open
2. **Chlorine (Cl):** osmotic and electrolytic balance - balances the charge of positive ions in cation transport, also used as a cofactor in photosynthesis  
*Deficiency:* stunted plant, bronze leaves, leaf chlorosis
3. **Copper (Cu):** component of Retinal (Vitamin A) and some enzymes  
*Deficiency:* Wilted shoots and young leaves, gray or brown leaf tips and necrosis
4. **Iron (Fe):** component of chlorophyll, so necessary for photosynthesis  
*Deficiency:* Interveinal leaf chlorosis, tips of leaves may turn upward
5. **Manganese (Mn):** Activates certain enzymes involved in chlorophyll production  
*Deficiency:* Interveinal leaf chlorosis, necrotic spots on leaves
6. **Molybdenum (Mo):** Reduces nitrate nitrogen ( $\text{NO}_3$ ) to forms usable by the plant, required for nitrogen fixation  
*Deficiency:* rare
7. **Zinc (Zn):** activates enzymes and plays a role in the production of chlorophyll  
*Deficiency:* Most common micronutrient deficiency; younger leaf interveinal chlorosis, wilted leaves, necrotic leaf tips and leaf edges

## **Honorable Mention:**

1. Silicon (Si): available as silicic acid, found in epidermal and other cell walls
2. Cobalt (Co): not utilized by plants but used by animals, algae, fungi, and bacteria as an active center of cobalamin coenzymes such as Vitamin B<sub>12</sub>
3. Nickel (Ni): utilized by bacteria in root zones to break down urea and other nitrogenous compounds

## **Relevance to H&G:**

All essential micronutrients are found in Base A&B, Roots Excelurator, Algen Extract, and Magic Green.  
Most, if not all of them, are found in Multi Zen and Bud XL as well.