

Minnesota Commercial Flower Growers Association Bulletin

Serving the Floriculture Industry in the Upper Midwest

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BEDDING PLANT NUTRITION

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Fully 80% of the telephone calls which I receive as an extension specialist are nutrition related. Of those calls, 75% of the question are the same problems with the same solutions. The only difference is that the companies who have problems differ.

The five most common nutrition problems for bedding plant crops are listed below. Our recommendation solution for each problem is also listed. I am not a plant nutritionist. However, I have had to develop simple, practical solutions to solve common nutritional problems. The solutions come from years of mulling over soil tests, looking at problems, and finding out what is the simplest, cheapest, and quickest solution to a problem.

Soluble Salts Damage

What is it? A measure of the total amount of soluble salt in your medium. It is measured by determining the ability of the leachate from your media to conduct electricity. The more salt there is in the media, the higher the conductivity.

Symptoms - Burning of the leaf margin. Burning of the root tips, i.e. root tips turn from white to brown. Wilting of plants during a sunny day even when the media is moist.

Solution - Leach the media with clear water. Leach for 15-20 minutes on a cloudy day or in the morning. Leaching with cold, clear water on a sunny day can result in wilting.

Low Fertility

What is it? Low levels of essential nutrients (especially nitrogen) for plant growth. A 'bulk' determination of low fertility can be made by measuring soluble salt levels.

Symptoms - General yellowing of leaves. Leaf yellowing usually starts from the top and moves down. Small leaves and stunted stem growth.



'High pH' is a pH value that exceeds 7.0-7.2. A high pH problem is usually expressed through a nutrient deficiency.

Low pH problems are often expressed by micronutrient toxicities.

If pH levels are above 7.0 the media will retain iron and magnesium. Therefore, these minerals will not be available for plant growth.

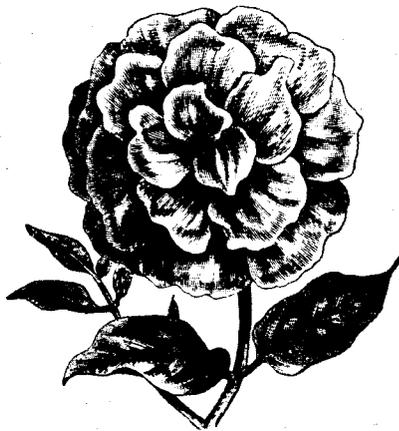
Solution - Fertilize with a balanced fertilizer. Often when nutrient levels are very low, you can fertilize at a higher rate, i.e. 300-400 ppm nitrogen, to bring the levels of nutrients up to the recommended ranges.

High pH

What is it? 'High pH' is a pH value that exceeds 7.0-7.2. A high pH problem is usually expressed through a nutrient deficiency. A nutrient deficiency occurs because specific elements are retained in the media and not available for plant growth even if the levels of the nutrients in the medium are in the recommended ranges.

Symptoms - The most common symptom is a chlorosis or yellowing of the plant.

Solutions - Acidify with either sulfuric or phosphoric acid. Nitric acid can also be used but it is extremely corrosive and is, therefore, very dangerous to handle. An immediate solution is to apply a stronger dose of acid to drop the pH level quickly. In general, 3.5 ounces of phosphoric acid per 100 gallons of water will drop the pH 0.5 units. This recommendation is only a 'shot-in-the-dark' approach because every media is different. Media which are highly buffered such as soil based media require more acid initially to change the pH. In contrast, relatively low buffered media such as peat based media often require less acid to change the pH. The best solution is to have a water test done (remember to request an alkalinity determination). Determine the amount of acid which you need to add to your water to adjust the water pH to 6.2-6.7 (call your extension specialist for this). Then inject acid into your water continuously through a 'double-headed' injector to maintain your water at the desired pH level.



Low pH

What is it? pH levels below 6.0. Low pH problems are often expressed by micronutrient toxicities. Problems usually arise on New Guinea impatiens, seed geraniums, and/or marigolds first. Manganese and iron are very available at low pH levels. New Guinea impatiens, seed geraniums, and/or marigolds tend to take up manganese and iron very easily. As a result nutrient toxicities can occur in these crops.

Symptoms - Growth is stunted on New Guinea impatiens, i.e. stem growth is reduced and new leaves are small and distorted.

Seed geraniums show stunted leaves, lower leaves develop a necrotic (dead) edge which spreads to the center of the leaf moving interveinally, spotting of the lower leaves can occur, lower leaf drop. Marigolds show a burning or 'scorching' of the lower leaves.

Solution - Stop applying fertilizers which contain micronutrients, especially manganese and iron. Raise your pH by either leaching (if your water pH is high) or drenching with flowable hydrated lime.

Note: The plant will have to grow out of the problem since nutrients can not be extracted from a plant.

Magnesium and/or Iron Deficiency

What is it? Insufficient levels of magnesium and/or iron in the medium or high medium pH resulting in a lack of availability of magnesium and iron for plant growth.

Symptoms - Magnesium deficiency - interveinal chlorosis starting on the lower leaves and moving up the plant.

Iron deficiency - interveinal chlorosis starting on the upper leaves and moving down the plant.

Solution - If pH levels are above 7.0 the media will retain iron and magnesium. Therefore, these minerals will not be available for plant growth. If the pH is too high, simply reduce the pH as mentioned above. If the pH is below 7.0 and deficiency symptoms are obvious, the levels of magnesium and iron may be low in the medium. If the level of magnesium is low, drench with a solution which contains 8 oz. magnesium

sulfate (epsom salts) per 100 gallons of water. We recommended doing this on a monthly basis.

If iron levels are low, add a material which contains iron. Symptoms can be temporarily alleviated by spraying plants with iron chelate. Longer term solutions include applying a trace element mix and/or iron sulfate to the medium.

Test your media regularly! I strongly recommended that each business purchase portable pH and soluble salts meters. Many problems

can be avoided by simply measuring pH and soluble salts readings on all crops each week. These instruments can pay for themselves 5 fold in a single year in soil test savings and reduction in crop problems.

Record data on graphs for each crop weekly. The graphs should show pH and soluble salts levels each week for the duration of each crop. In this way, you can compare weekly readings and see how pH and soluble salts levels are changing over time and the speed at which they are changing for each crop.

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