Feast or Famine:

Managing Iron Deficiency and Toxicity

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Reports of iron deficiency in greenhouse crops are on the rise, due in part to the popularity of vegetatively produced crops that have lower soil pH requirements. Iron deficiency usually results from high medium pH, insufficient fertilizer or diseased root systems.

If roots aren't functioning effectively, they cannot supply adequate nutrients to the foliage. Symptoms appear as an interveinal chlorosis of the youngest foliage. Untreated, the chlorosis progresses back from the growing tips to affect the older growth as well. Often the plant becomes severely stunted and overwatering follows, resulting in Pythium root rot.

Iron deficiency on calibrachoa

Some plants are less efficient at taking up iron and are more susceptible to deficiency; among these crops are bacopa, basil, brachycome, calibrachoa, diascia, nemesia, pansy, petunia, scaevola, snapdragon and vinca. These plants, which quickly show iron deficiency symptoms, should be grown at a lower pH range (5.4-6.0) in order to increase iron availability.

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The iron chelates, **Sprint® 138 and 330**, are valuable tools in helping to quickly restore plants to good green color and full vigor. Sprint 330 is a 10-percent chelated DTPA iron, and performs best when the pH is close to the recommended range (6.0-6.5). Sprint 138, a six-percent fully chelated EDDHA iron, is preferred when the symptoms are more severe or pH is over 7.0. Soil drenches of 3-5 ozs. per 100 gallons are the safest way to apply the Sprint products. Rinse the foliage with clear water immediately after the application to reduce the risk of phytotoxicity from concentrated iron remaining on foliage. Damage would show as brown or black spots. Correcting underlying high media pH is helpful to keep the problem from recurring.

On the other end of the spectrum, we must be aware not only of micronutrient deficiencies, but toxicities as well. Geranium growers have experienced iron/manganese toxicity at low media pH (below 6.0). The remedy is to adjust fertilizer programs to keep soil pH between 6.0 and 6.5 for seed and zonal geraniums, lisianthus, African marigolds, pentas, New Guinea impatiens and lilies.

Iron/manganese toxicity on marigold

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Monitoring media pH is an essential part of producing top-quality plant material. Despite using pH-adjusted growing media, there are times when media pH falls below optimum levels during crop production. Irrigation water quality, fertilizer selection and even the crop itself can cause significant changes to the pH. When growing a wide range of crops on the same irrigation system, some pH conflicts can also occur.

Fortunately, tools are available to help us raise media pH, if levels have dropped below the ideal. **Limestone-F** and **potassium bicarbonate** have both been used successfully for this purpose. CalOx from BioSafe is a new product showing promise for raising soil pH as well; GGSPro will be taking a closer look at this product in the near future. Your production practices may make one or another more practical for you.

Always read and follow all label directions. Not all products are registered for use in all states or for all crops; your Griffin Customer Service Representative can help determine whether these products are labeled in your state. Products other than those mentioned here may also be safe and effective.

Featured Products

Product	Size	Item No.
Sprint 138	5 lbs.	67-7037
Sprint 330	5 lbs.	67-7036
Limestone-F	2.5 gal.	75-6025
Potassium bicarbonate	1 lb.	91-2190