

bottom line is simply that the flashy changes that can be made in flower color is only a small part of the potential of biotechnology. The more potent changes such as genetic engineered resistance to tomato spotted wilt virus will only come about with longer term research on isolating resistance genes and understanding mechanisms of resistance.

Biotechnology offers a new and exciting tool for the plant breeder but in itself is not a solution to all problems. Thus, we must keep a balanced perspective on our funding priorities and must not abandon sound conventional breeding methods for the high profile techniques of biotechnology.

Our industry stands to gain much from the current efforts in plant biotechnology but the rewards can be even greater if it can be combined with conventional planting breeding methods. Progress in both areas can lead to plants that are not only different but better and easier to produce. Biotechnology offers the way to make rapid progress in plant improvement and conventional plant breeding methods and evaluation procedures will help ensure more rapid progress and truly superior varieties for commercial production.

What is next on the biotechnology front? Maybe, glow in the dark flowers!

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## Soil Test Review

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| Crop       | pH  | SS | NO3 | NH4 | P | K  | Ca  | Mg | Na | Fe  | Mn  | Zn  | B   |
|------------|-----|----|-----|-----|---|----|-----|----|----|-----|-----|-----|-----|
| Poinsettia | 6.3 | 76 | 87  | 24  | 9 | 50 | 111 | 17 | 20 | .39 | .42 | .04 | .06 |

This soil test shows low nitrates and high ammonium. The magnesium level is also low. This type of problem has been showing up on a number of recent soil tests.

I. The ammonium level needs to be lowered. The fastest way to do this is to leach the media. Media which contain greater amounts of soil can have ammonium build up more readily than soilless mixes.

High ammonium levels are often seen as greenhouse temperatures decrease in fall and winter, especially when fertilizers containing ammonium are used. If you have high ammonium levels, discontinue using fertilizers that contain ammonium.

Problems with ammonium toxicity can be increased by high pH, low potassium and low light. Therefore, other ways to reduce ammonium toxicity include lowering pH and increasing potassium levels. In the case of this soil test, the pH is at a recommended level. Since there are other

options to deal with the ammonium toxicity, the pH should be left alone. An increase in the potassium level would be an option, however, the best solution would be to simply leach the medium.

II. Low nitrate levels can be dealt with easily by increasing the ppm of nitrogen in the fertilizer mix, if you mix your own fertilizer. If you do not mix your own fertilizer, select another premixed fertilizer with a higher nitrogen content. If you leach to remove the ammonium, you will have to follow up the leaching with a one time 400-600 ppm fertilizer application.

III. Low magnesium levels can cause interveinal yellowing of the lower leaves on a plant. Since magnesium leaches readily from the medium, regular applications may be necessary. Drench a minimum of once a month with magnesium sulfate (Epsom salts) at a rate of 8 ounces/100 gallons. Do not mix magnesium sulfate and calcium nitrate together in a stock tank, they will react and fall out of solution.

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