

# What's New In Geranium Production?

John Erwin

Department of Horticultural Science, University of Minnesota

## Introduction:

Geranium production has changed again during the last 10 years. Most of us remember the shift from vegetatively propagated geraniums during the 1970's to seed propagated geraniums during the 1980's. During the last 10 years there has been a slow shift back to many of the vegetatively propagated geraniums. The reasons for this are not clear, but I believe are associated with the attractiveness of the large flower heads, increased stress resistance, new dark-leaved forms that highlight the flowers, or an increase in the desire of the consumer to simply have a larger plant. In most cases, growers sell these geraniums as larger plants in larger containers to compensate for the increased cost of the cutting compared to the seed.

Because of the shift back to many of the cutting propagated forms there are some old and new issues that you, as growers, should be aware of. These issues include Florel applications, disease issues, pH issues, and growth retardant issues.

## Florel Application.

Florel is applied to cutting propagated geraniums to inhibit flowering. In contrast to seed propagated geraniums, cutting propagated geraniums are already mature and are therefore capable of making flowers. Allowing a flower head to form early in the season saps energy from desired vegetative growth and produces an inflorescence that is very

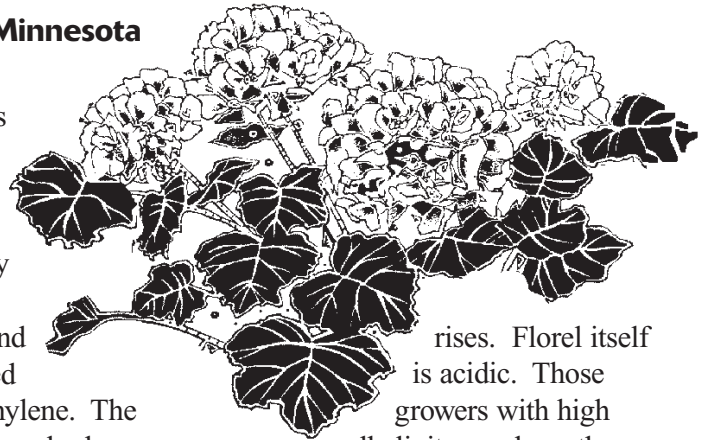
susceptible to Botrytis infestation. For this reason, growers have routinely removed flower heads manually early in the season.

Florel is a compound that after being applied to the leaf releases ethylene. The ethylene results in flower bud abortion which eliminates the need for manual removal of flowers, i.e. saves labor. We have found little evidence that the ethylene produced from a Florel application affects any plants adjacent to sprayed plants that have not been sprayed. In fact, it is possible to apply Florel to half the plant and only have that half affected!

In general, a single Florel application (250 ppm) eliminates flowering for 6 weeks. Therefore, you should not apply it any later than 6 weeks prior to the sale date. Florel application will also reduce leaf size, reduce stem elongation, and increase branching. . . .all desirable effects early in production. It is very important to realize that the effect of a Florel application can be affected by the temperature when the compound is applied and the ph/alkalinity of the water that the Florel is being mixed with!

In general, the efficacy of Florel decreases as the temperature at spraying increases. For this reason, the recommended rate of Florel applications usually increases as the season goes on until you reach 500 ppm.

The ethylene is released from Florel when the pH of the solution



rises. Florel itself is acidic. Those growers with high alkalinity can have the ethylene being released in the spray tank prior to it getting to the plant because the pH of the spray solution has already increased too high. For this reason, I frequently recommend that growers with high alkalinity water should either use distilled water for spraying, or add acid to reduce alkalinity prior to adding the Florel to the spray tank. Regardless, the solution of the spray with the Florel added should not exceed 5.0.

## Xanthomonas and Ralstonia

*Ralstonia solanacearum* race 3 biovar 2 has been detected on zonal geraniums from a number of propagators outside of Minnesota during the last few weeks. Some of these growers/propagators ship product to Minnesota. This disease is monitored by the federal government because of its devastating impact on potatoes and tomatoes.

*Ralstonia* and *Xanthomonas* are bacterial diseases which can aggressively spread throughout a geranium crop through splashing water or through recirculating mist systems. These diseases can spread slowly during cooler times of the year and then proliferate rapidly when temperatures get warm.

Ralstonia can be quite persistent.

Symptoms appear similar to the two bacterial blights. Both diseases can result in sudden wilting of leaves or the whole plant. With *Xanthomonas*, we have observed both sudden leaf and plant wilting, black spotting of lower leaves that coalesce into larger black areas, eventual plant death. With *Ralstonia*, we have observed lower stem rot and yellowing and wilting of the lower leaves in Minnesota in previous years. *Xanthomonas* can result in a green leaf wilting whereas *Ralstonia* seems to result in leaf wilting after the leaf yellows. This is one of the few observable differences which we can see.

Bacterial diseases are not curable. If you suspect that you may have these diseases, 1) isolate plants, minimize or eliminate watering that results in splashing water, 3) do not handle potentially diseased plants and then touch undiseased plants, have the plants tested to determine if you have either disease. There is some evidence that repeated Phyton-27 applications can limit spreading of the diseases between plants. If you confirm the existence of either disease, throw all potentially infected plants away. You must report the occurrence of this disease to the Minnesota Department of Agriculture.

### Low pH Problems

We have known for quite some time that pH levels below 6.2 can result in micronutrient toxicity in seed geraniums. I have noticed though that over the last 5 years, more and more of the Zonal geraniums can get micronutrient toxicity when the pH is low. However, I have noticed that this problem is very cultivar specific.

Symptoms include:

- 1) general slowing or stunting of growth
- 2) burning along the leaf margins of lower leaves
- 3) combined manganese (Mn) and iron (Fe) levels above 300 ppm. The problem absolutely occurs when the combined levels of these two exceed 600 ppm.

What does this mean for you?

First, grow your geranium crop at a pH of 6.2 – 6.8. Since many greenhouse media start at pH levels lower than this, it is important that you increase media pH prior to planting. Increase media pH by leaching with unacidified water if your water alkalinity is higher (>180 meq CaCO<sub>3</sub>), drenching with a liquid lime, or fertilizing with an alkaline fertilizer (nitrate-based with a ‘basicity’ reading).

If plants already have the problem, the only thing you can do is increase the pH to stop the problem from getting worst and grow plants warm to allow them to grow out of the problem by diluting the levels of Mn and Fe in the tissue.

### Growth Regulator Issues

It seems as the breeding programs for zonal geranium have gone in either of 2 directions: breeding for shortness of stature, or breeding for high vigor and large flower heads. Therefore, geraniums from each of these groups have different new growth regulator issues associated with them

In addition to changes with breeding programs, we have had the introduction of the growth retardants Bonzi and Sumagic. Both of these compounds are

actually cheaper to apply than Cycocel (the traditional growth retardant used on geraniums). However, you usually need a little more skill when applying them to have as great a spray uniformity as possible. In general, I have found that Sumagic is better for geranium production than Bonzi. Having said this, Cycocel at lower rates (with increased frequency) gives greater flexibility at lower rates on dwarf cultivars.

Those cultivars that are shorter and almost dwarfed need little if any growth retardant. Tango was one of the first cultivars of this type. The plants are typically short, have darker green leaves, and are heat tolerant. Cycocel can be used on these cultivars (500-750 ppm) to tone plants and reduce elongation slightly.

In contrast to some of the shorter cultivars, some of the newer very vigorous cultivars may require either frequent Cycocel applications (750 ppm) or a Sumagic application (1/2 – 4 ppm). If you use Sumagic, start at the \_ ppm rate at the beginning of the season and increase your rates to 4-8 ppm as temperatures increase, spacing decreases and DIF increases.

In some cases, growers may want to increase height on a heat tolerant (often shorter) cultivar such as Tango to make it a larger patio plant. To do this, spray Pro-Gib (10 ppm) on plants on a regular basis, i.e. every 2-3 weeks if you want a pillar geranium from a Tango-like cultivar. This will increase internode length, or stretch. In contrast, if you just need a little more height, a single application of Pro-Gib may be all you need.