

# BACTERIAL WILT OF GERANIUM: A CONTINUED THREAT

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Bacterial Wilt or Blight of Geranium (*Pelargonium x hortorum*), caused by the bacterium *Xanthomonas campestris* pv. *pelargonii* (Xcp), has the potential to be the most destructive disease associated with greenhouse geranium production. The disease was first reported in geraniums over 60 years ago and despite our best efforts, as we enter the year 2001, it is still a major threat to the industry.

In most of the cases the bacterium that causes Bacterial Wilt of Geranium enters the greenhouse in geraniums that are infected. These could be rooted or unrooted cuttings, pre-finished plants, ivy geraniums, or specialty geraniums. Though a very high percentage (99.9999%) of geraniums that a grower brings into the greenhouse are not infected, every now and then an infected plant slips in. The purpose of this article is to gain a better understanding of Bacterial Wilt of Geranium and the methods used to manage this disease once it enters and becomes established in the greenhouse.

## Disease Development and Spread

In the greenhouse the bacterium is moved from the source plant to other plants by splashing water or by human contact. Once the bacterium makes contact with the plant it enters the host through wounds or natural openings in the roots, leaves or stems. Inside its host, the bacteria multiply and spread systemically through the plant's vascular tissue. The sheer number of bacteria along with the extracellular carbohydrates (xanthan gum) produced by the bacteria, literally plug the infected plant's vascular tissue. Due to the blockage the plant can no longer transport adequate water or nutrients.

Strict attention must be paid to plant handling and watering practices in an effort not to spread the disease. If an infected plant goes undetected, the bacteria produced in this plant can move rapidly to adjacent plants via splashing water, plant to plant or human contact. If left unchecked the entire crop can become infected. One infected plant produces enough Xcp to infect the entire geranium crop.

## Symptomatology

The first indication of a problem is wilting of one or two plant leaves during the heat of the day. Sometimes the petiole that connects the leaf to the stem remains turgid and the wilted leaf looks like an umbrella. The plants may recover from the wilt during the evening but eventually over a period of days permanent wilting sets in. The wilted leaves turn yellow then brown. In the advanced stages of the disease the stem of the infected plant will turn black. Eventually the entire plant will collapse to the media and die. This disease can be distinguished from Pythium Root Rot in that the roots of an Xcp-infected plant are white and not

rotted. If geraniums are wilting and show no indication of Pythium, Bacterial Wilt should be a serious consideration.

Some cases of Bacterial Wilt start out as leaf spots and not wilt. These leaf spots can be small with a water-soaked appearance at the margin or they can be v-shaped starting from the leaf margins inward. Leaf spots are not a good indication of Xcp infection because many other pathogens including Botrytis can cause this type of symptom.

If, based on symptoms Bacterial Wilt is suspected affected plants should be removed from the greenhouse and samples should be tested. If the suspect plants test positive immediate disease control and management procedures should be put in place.

## Disease Prevention and Management

To date there is no horticulturally acceptable resistance or tolerance to Xcp in *P. hortorum*. The best method of controlling this destructive disease is to keep it from entering the greenhouse. This is termed exclusion. The purchase Xcp - free plant material is critical in excluding the pathogen from the greenhouse. This is THE one control guideline that can make or break your season. If you do not purchase geranium stock material that has been subjected to bacterial disease-indexing then you will eventually have a Bacterial Wilt problem. You have my word on it! Once you have purchased this Xcp-free material it is important that you do your best to keep it that way. One of the mistakes growers make is to mix geraniums from different sources together once they are in the greenhouse. Geranium plants infected with Xcp may not show any obvious symptoms. An asymptomatic plant can serve as a source of infection regardless of symptom expression. Keep plants separated until you are absolutely sure they are disease-free. This also holds true for Ivy geraniums which are notorious for being a source of the bacterium. Ivys can be infected and go their entire greenhouse life without showing any indication of infection. If grown over other geraniums, the drip water coming out of the bottom of an infected plant can be the source of infection for dozens of plants below. Grow Ivy geraniums over some other crop.

*Mark your calendars!*

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These are just a few of the things that can be done to prevent the disease from taking a toll on your crop and if followed they can be a major factor in a disease-free production year. The following is a more complete list of guidelines for dealing with Bacterial Blight of Geranium. Bacterial Blight Do's and Don'ts that if followed will go a long to a disease-free crop.\*

### DO'S

- Always start with stock material or unfinished plants that have come from a source that has subjected the material to culture indexing.
- Keep geraniums material purchased from different sources separated in the greenhouse (Quarantine incoming material).
- Maintain a high degree of greenhouse sanitation.
- Monitor the crop daily for evidence of the disease.
- Make sure that the personnel that work with the geraniums can recognize the symptoms of Bacterial Wilt.
- Make sure that you limit the number of personnel that handle the geraniums in the greenhouse.
- Have questionable plants tested by a private testing-service or university-based lab.
- Grow seed geraniums. They are less likely to have a problem.
- Use copper-based products to slow down the plant to plant spread.

### DON'TS

- Try to grow your own stock plants.
- Carry over geraniums from one year to the next.
- Grow perennial, scented or specialty geraniums in the same house as the seed and zonal geraniums.
- Grow Ivy geraniums over the top of seed and zonal geraniums.
- Allow the unrestricted flow of personnel throughout the geranium crop.
- Reuse trays or pot that housed infected material from previous years.
- Splash water from pot to pot.

**Note:** During the 1999-2000 growing season Bacterial Wilt became a serious problem when it was introduced into some greenhouses in infected scented geraniums associated with a major retailers special promotion. These plants showed no outwardly symptoms of Xcp-infection yet when tested were strongly positive. If you are a grower involved in this promotion this year be careful not to mix any of these specialty geraniums with any of your zonal or seed material at anytime during the entire growing season.

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