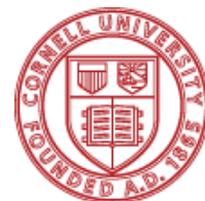




## Blossom Drop in Tomatoes and Peppers

By Mike Nuckols, *Local Foods & Horticulture Program Manager*



While visiting local vegetable farms in July and early August, I noticed that many farmers had beautiful tomato plants with ripe fruit set early in the season – but relatively young fruit to ripen in the coming weeks. Several growers reported having no bell pepper fruit at all despite healthy plants. This was particularly true for plants grown in high tunnels. I also noticed dead, unpollinated blossoms on otherwise healthy tomatoes. A gentle touch would cause them to fall to the ground. A few worried that their tomatoes might have blight when they saw leaves curling and turning dark brown at the edges. Was there some mysterious disease?



The real culprit was something entirely different: high temperatures and drought. Pollination and fruit-set in peppers and tomatoes is inhibited when daytime temperatures rise above 85 to 90°F. Dry soil and windy hot weather, as we had in July, can also inhibit pollination and fruit set. Lack of moisture can cause leaves to curl and eventually die back, inhibiting fruit production.

Early drought and heat stress in tomatoes.

July is, on average, the warmest month in Watertown. This past July was no exception with several records broken. Seventeen of 31 days in July were at 85°F or higher! Used to the North Country's typically mild summers, this heat took many growers by surprise. Couple this heat with inadequate ventilation in high tunnels and you have the perfect recipe for blossom drop.

Sensitivity to high temperatures varies by variety, particularly in peppers. For example, bell peppers are especially sensitive to temperatures over 85°F. Hot pepper varieties, on the other hand, are more tolerant. Ensure that more susceptible varieties are started early enough that they can set fruit before July heat-waves strike. For example, those growers who planted bell peppers in large 4" pots with blooms on them (or nearing bloom) in June, had bell peppers in early August when others did not. The choice of bell pepper variety also matters. Some are more heat resistant and better suited to high tunnel production.

Adequate water is critical. During dry spells, plants cool themselves the same way that we do – through evapotranspiration of water. During hot and dry spells, growers need to ensure that plants have consistent and adequate water. This can be difficult. Despite having drip irrigation systems, I saw many tomatoes in high tunnels with clear signs of water stress: curled leaves or dark brown margins on the leaves indicating that the plants had wilted and then recovered when watered the following morning. During extreme heat, watering twice a day may be necessary.

Ventilation in high tunnels is critical. Inadequate ventilation can cause high tunnel temperatures to quickly reach 100°F or higher early in the morning and stay there throughout the day. The ability to roll up the sides of the tunnel and open up doors on the ends helps greatly. Forced air ventilation is also needed at the gables to pull hot air from the peak.

Many growers skimp on ventilation in high tunnels and greenhouses with the idea that this will help retain heat in the winter. This is misguided. Even in the winter, ventilation is needed to prevent excessive build-up of humidity and associated disease. Even during the short days of fall and winter, tight high tunnels with actively growing plants can deplete carbon dioxide to the point that growth can stop entirely. Some growers

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remedy this by pumping carbon dioxide into the structure! The bottom line is that ventilation is needed year-round.

Another factor that I observed in several high tunnels was out of control weed growth. Weeds compete with tomato and pepper plants, sapping them of vital moisture and nutrients. Adequate weed control is essential in general, but particularly during the hottest times of the year. Weeds can be controlled by pulling, cultivation, mulches, or flame-weeding at the cotyledon stage (just don't get near the edges of your tunnel!).

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