

## Helping Fruit Set in Tomatoes

The high temperatures we have had this week and probably next week with daytime highs at 90oF and above and nighttime lows only getting down to 70oF in much of the mid-Atlantic may cause blossom drop and fruit abortion in tomatoes. Ordinarily in tomato fields pollination is achieved just by the action of the wind. Pollen

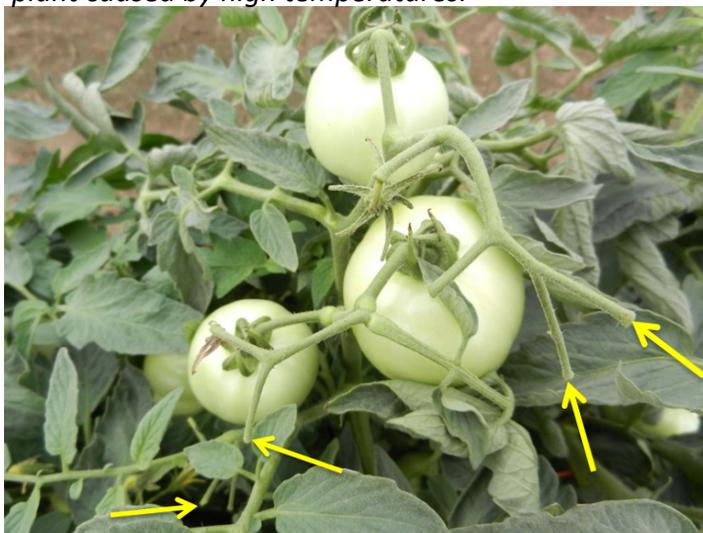
*Fig. 1 Several flower pedicels turning yellow (arrows).*



is released from the tomato flower and falls onto the stigma. Without pollination flowers die and drop. In tomatoes the pedicle turns yellow before the flower falls from the plant (Fig. 1). Tomato flowers must be pollinated within approximately 2 days of becoming viable or they will abort. Tomato plants can tolerate extreme temperatures for short periods, but several days or nights with temperatures above 86oF (daytime) or 70oF (nighttime) will cause the plant to abort flowers (Fig. 2). At these temperatures the pollen can become sticky and/or nonviable, preventing pollination from occurring. The relative humidity also plays a role in pollination with high levels (>80% RH) during pollen shed causing the pollen not to be released properly resulting in poor or incomplete pollination.

There are some possible remedies to these high temperatures that could increase pollination and fruit set. One of the things I have been working on the last several years is using shade cloth that is draped over the tomato stakes when plants begin to set fruit. Timing of the shade cloth is important as you cannot put it over the plants during vegetative growth as this will decrease growth. However you also cannot wait too long after fruit set begins or you will lose the advantages of the shade on fruit quality. In my studies with shade cloth and tomatoes, yields were increased in the shaded areas by an average of 30%, quality and size of tomatoes increased significantly when the same varieties were shaded vs. when they were not (Fig. 3). Two years ago when it was not very hot and we had good rainfall throughout the summer yields still increased in the shaded areas vs non shaded areas by about 15%. I do not think growers should go out and cover all of their tomato fields with shade cloth, but it could be used

*Fig. 2 Aborted flowers and fruit (arrows) on tomato plant caused by high temperatures.*



for certain tomato varieties that are grown because customers really like them, but the tomatoes just do not produce well in the summer heat. This shade method does not work inside high tunnels as the entire structure needs to be covered to reduce heat, not just the rows inside. There are other trials being conducted to help tomatoes and other vegetables come through the heat, but those results will have to wait.

*Fig. 3 Tomatoes in the bin on the left were harvested from shaded areas with white plastic mulch while tomatoes in the bin on the right were harvested from non-shaded areas with black plastic mulch.*

