

WATCH YOUR TEMPERATURE TO ENCOURAGE FLOWERING

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To maximize growth and/or flowering, it is imperative that you, as a grower, understand what are the optimal temperatures to maximize growth during each stage of development in your crop.

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All plants have optimal temperatures for growth. The optimal temperature for growth usually is dependent on the environment which the plant originated from. Therefore, plants which originated from tropical climates tend to have optimal temperatures for growth which are warmer than plants which originated from temperate or cooler climates.

Plants have evolved in environments which are not constant but are changing. Therefore, it makes sense that different phases of growth, which occur at different times of the year, may have different temperature optima. Each phase of growth during plant development, i.e. rooting, flowering or seed germination, may have a different optimal temperature. For instance, germination of Morning Glory (*Pharbitis nil*) has an optimal temperature of constant 76°F. In contrast, the optimal temperature for flower initiation is 80°F. Similar fluctuations in optimal temperatures are known to occur with peppers, tomatoes, chrysanthemum, geranium, etc.

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Clearly, at different times in the development of a given crop we are trying to encourage different aspects of growth. For instance, during the development of a chrysan-

themum crop we typically need to root the crop, pinch and encourage 'breaking', promote leaf unfolding and development, encourage flower initiation and encourage flower development. Each of these stages has a different temperature optima. Are you encouraging stem, root, leaf or flower development with your temperature regimes?

Much of this information is unknown for many of the crops which we grow. However, recent research has shed some light onto what temperatures are optimal for some major floriculture crops (Table 1).

The most common problem, from my experience, is that temperatures are too warm or too cold during the flower initiation and/or development stage. For example, the optimal temperature for fuchsia flower initiation and development ranges from 68-74°F. Often fuchsia are hung in the warmest parts of the green-

Table 1. Suggested temperature optima for different phases of growth of significant floriculture crops.

Plant	Stage	Temperature (°F)
Easter Lily	Flower Induction	42-45
	Flower Initiation	63-65
	Flower Development	68-75
	Leaf Unfolding	80-85
Regal Geranium	Flower Induction	42-50
	Flower Development	55-61
Zonal Geranium	Flower Development	50-60
	Leaf Unfolding	76-80
Gerbera	Flower Initiation	70-75
	Leaf Unfolding	76-80
Fuchsia	Flower Initiation	65-68
	Flower Development	68-72
	Leaf Unfolding	76-80
New Guinea Impatiens	Flower Development	68-74
	Leaf Unfolding	76-80
Chrysanthemum	Flower Initiation	65-68
	Flower Development	63-63
Schlumbergera	Flower Initiation	68-70

house where temperatures commonly exceed 74°F. As a result, fuchsia flower initiation is delayed and the number of fuchsia flowers per plant is reduced from 6 per node to 2 per node.

Similarly, zonal geraniums have optimal temperatures for flower development which are substantially lower (approximately 10-20°F) than that for New Guinea Impatiens, yet these two crops are often grown side by side in a greenhouse. Clearly, the quality of one crop is unknowingly sacrificed for the quality of the other crop!

To produce the highest quality crop in the shortest amount of time, you must know what the optimal temperature for each stage of development. We are currently working to deter-

mine the optimal temperatures for flower initiation of cyclamen, cineraria, calceolaria, poinsettia, etc.

Interestingly, to complicate matters, the optimal temperatures for each stage of development may be more dependent on the day temperature or the night temperature. For instance, flower initiation of poinsettia is primarily dependent on night temperatures. In contrast, flower initiation of fuchsia is primarily dependent on day temperature.

Clearly, we have a lot to learn when it comes to what environment is 'best' for plant growth. Our job, at the universities, is to get you this information. Your job is to use it!

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"B-TYPE" WHITEFLY IS NEW SPECIES

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The "B-type" or "poinsettia" whitefly that has wreaked massive amounts of damage on vegetable crops in the southwestern U.S. has been identified as a previously unknown species, not just a variant of the common sweetpotato whitefly.

Since the insect causes a disease in squash called squash silverleaf, it should be named the silverleaf whitefly, say Dr. Thomas M. Perring and other University of California (UC) entomologists. They released their findings in the January issue of the journal *Science*.

Although the pest has been identified as a separate species, scientists are quick to note this does not change the current control methods. But, the designation will make a difference in the long-term effort to find predators and other biological methods to control the whitefly, says UC spokeswoman Kathy Barton.

The insect attacks melons, lettuce, broccoli, cauliflower, carrots, celery, asparagus, squash and tomatoes. It sucks nutrients out of plants and secretes a sticky material that promotes growth of fungi.

The Same, But Different

The research team noted that outwardly, the silverleaf species looks exactly like the various strains of sweetpotato whiteflies that have been a troublesome, but relatively routine, pest for years.

Perring and his colleagues conducted experiments showing the silverleaf whitefly is genetically distinct and reproductively isolated from the cotton strain of the sweetpotato and silverleaf whitefly. No eggs were fertilized when scientists tried to cross the two species. They also found the sweetpotato and silverleaf whiteflies wouldn't copulate despite showing courtship behavior.

The name of the new species was carefully chosen. The bureaucratic-sounding "B-type" was selected 2 years ago because such names as "poinsettia" and "sweetpotato" whitefly offended certain grower groups.

"We chose silverleaf very carefully," Perring said. "It is diagnostic and grower-friendly."

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