

# Temperature and Ethephon Affect Growth and Development of Several Vegetative Bedding Plant Species

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**Production Challenge:** Producing annual bedding plants from vegetatively propagated cuttings can introduce reproductive variability within a crop because cuttings can be at different stages of development when propagated. Non-uniform flowering sacrifices plant quality and prevents bench-run sales of a crop. Ethephon, sold as the commercial product Florel, is an effective tool for inducing bud and flower abortion, therefore synchronizing flowering of a crop. The objective of these experiments was to quantify the time necessary for a crop to flower following Florel applications at different temperatures.

**Objective Experiment 1:** Quantify the time to flower for seven vegetatively propagated bedding plant species following 0, 250, or 500 ppm ethephon application in a 68 °F greenhouse and then moved, one day later, to four greenhouse temperature sections maintained at 64, 70, 73, and 79 °F.

**Objective Experiment 2:** To determine the influence of temperature at a constant vapor pressure deficit (VPD) on *Impatiens* 'Musica Dark Pink' and *Verbena* 'Temari Patio Pink' flowering plant response to Florel.

**Experimental Protocol:** See time-line on reverse side.

## Plant Species tested:

1. *Impatiens* 'Musica Dark Pink'
2. *Verbena* 'Temari Patio Pink'
3. *Verbena* 'Tapien Blue Violet'
4. *Argyranthemum* 'Yellow Grande'
5. *Bidens* 'Golden Star'
6. *Lantana* 'New Gold'
7. *Scaevola* 'Oro Blue'

## Results and Conclusions:

### *Experiment 1*

- The time to flower decreased with increasing temperature for both control and treated plants (see Table 1).
- The time to flower following pinch in control plants or 500 ppm ethephon-treated plants was relatively similar.
- There was a **greater** delay in time to flower following ethephon application for plants grown at **lower** temperatures than higher temperatures.
- Ethephon greatly reduced stem elongation at **lower** temperatures.

### *Experiment 2*

- Ethephon applied in each VPD-controlled temperature section increased flower delay in *Verbena* 'Temari Patio Pink' plants.
- A longer drying time when ethephon is applied in a humidity-controlled environment may increase ethephon penetration into leaf and increase plant response.

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Table 1. Approximate time to flower (weeks) following one pinch or single 500 ppm ethephon application (Expt. 1). Cuttings were stuck in early to mid-February 2003. Natural light and supplemental high-pressure sodium light were delivered to provide a 16-h photoperiod. Plants were irrigated regularly with a water-soluble fertilizer.

Species	Time to Flower (weeks)			
	Temperature °F (°C)			
	64 (18)	70 (21)	73 (23)	79 (26)
<i>Impatiens</i> 'Musica Dark Pink'	5	4	3.5	3
<i>Verbena</i> 'Temari Patio Pink'	7	6	5	4.5
<i>Verbena</i> 'Tapien Blue Violet'	7.5	6	5.5	4.5
<i>Argyanthemum</i> 'Yellow Grande'	8	7	6.5	6.5
<i>Bidens</i> 'Golden Star'	6.5	6	6	6
<i>Lantana</i> 'New Gold'	6	5	4	3
<i>Scaevola</i> 'Oro Blue'	6.5	5.5	5	4

