acynmidol applied as a bulb-dip prior to cooling. Concentrations as low as 50 ppm effectively reduced plant height without significant delays in flowering. While further research is needed using precooled and CTF programming, additional cultivars, and a range of bulb sizes to determine the economics and practicality of the system, this research does suggest that pre-treated case-cooled bulbs might eliminate the grower's need to apply chemical growth retardants.

Literature Cited


Effects of Photoperiod and Pinching on Development of Begonia x tuberhybrida

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Department of Horticulture, Oklahoma State University, Stillwater, OK 74078

Additional index words: tuber, flowering

Abstract. Long days with incandescent lighting at 1700-2200, 2200-0300, or 1700-0800 hrs after 9 hrs of natural daylength promoted taller plants and higher percentage of flowering than short days (9 hrs natural daylength) in ‘NonStop Yellow’ tuberous begonias. Only 3 unpinched and none of the pinched plants flowered in short days during an 11 week experiment. Short days greatly enhanced tuber development, whereas long days prevented significant tuber development. Pinching delayed flowering, but did not affect tuber development.

Effect of photoperiod and pinching on flowering of Begonia x tuberhybrida

Hybrid tuberous begonias were selected from a group of plants hybridized from several Andean species (1). These selections are economically important in Europe, and more recently in North America (5). Flower colors include tones of white, yellow, orange, red and pink (4, 7). There are staminate and pistillate flowers on each plant. Double flowers are more abundant and showy than single flowers (6). The F1 ‘NonStop’ series from Europe produces about 70% double, semidouble, and crested flowers, with the remainder being duplex flowers 5 to 7.5 cm in diameter (8). Seed germination is the principal propagation method (2, 8, 9). Larson (6) and Ball (2) recommended November seed sowing for spring flowering pots and hanging baskets. Started seedlings are available from specialist growers, and 5.7 cm seedlings will flower in 6 to 7 weeks in 10 cm pots, or 8 to 10 weeks if pinched and grown in 15 cm pots (9). Long days are necessary for growth and early flowering (2, 3, 6, 9), and tuber formation is prompted by short days (6). Growth of some genotypes is less under low light conditions (3).

Optimum lighting treatments (extended day or ‘night-break’ lighting) have not been identified (Jack S. Sweet, personal communication), so variations of long day treatment were compared. The experiment was designed, using ‘NonStop Yellow’, to compare 4 photoperiod treatments on plants grown either without pinching (No-Pinch) or with a single pinch (Pinch) to induce branching. This made a total of 8 experimental treatments.

The research was conducted in a fiberglass-covered greenhouse. Seedlings in 5.7 cm pots arrived March 4, 1981 and were transplanted, one per pot, to 11.4 cm pots March 7. The growing medium was a mixture of 0.465 m³ sphagnum peat, 0.155 m³ vermiculite, 0.155 m³ perlite plus 5.4 kg dolomite, 1.134 kg superphosphate, 680g KNO₃, and 85g fritted trace elements. A 20N-8.8P-16.6K fertilizer was applied every 2 weeks to supply 500 mg/liter N, mg/liter P, and 415 mg/liter K per application. The night temperature was maintained as closely as possible to 15.5–17.2°C, with daytime temperatures 18–20°C on cloudy days and 21–23.8°C on sunny days. Near the end of the experiment, daytime temperatures sometimes exceeded this range.

On March 12, the photoperiod experiment was started, with 4 photoperiods:
1. 9 hr photoperiod — natural daylight 0800 – 1700 with no supplementary light (9 hr day).
2. 14 hr daylength including 9 hr natural daylight (0800 – 1700) plus incandescent light 1700 – 2200 (light 1700 – 2200).
3. 14 hr daylength including 9 hr natural daylight (0800 – 1700) plus incandescent lighting 2200 – 0300 (light 2200 – 0300).
4. 24 hr daylength including 9 hr natural daylight (0800 – 1700) plus incandescent lighting 1700 – 0800 (24 hr day).

The experiment was designed as a split plot, with the main plots (photoperiods) in a 4 x 4 latin square design with 12 plants per bench, and the pinching treatments (subplots) contained within each main plot. A 75 watt bulb was suspended 91 cm from the bench or 81 cm from the pot rim, supplying about 205 lux of light at plant level. All benches were covered with black cloth at 1700. The appropriate supplementary lighting followed, and the black cloth was removed at 0800.

The least square means in the 4 replications of each treatment were used for the analysis of variance, derived only from plants which responded.

Unpinched plants in long days flowered significantly earlier for the 1st and 2nd bloom (Table 1). There was no interaction between photoperiod and pinching. Early flowering of unpinched plants in short days is misleading, since only 12.5% of the plants flowered throughout the 11 week period. Genetic seedling variation may be responsible, with some seedlings initiating flowers prior to start of treatments. Flower diameter was smaller in unpinched plants in short days than in long days. Dry weight was not significantly greater than in long days in unpinched plants in long days. Dry weight was not significantly greater than in long days in unpinched plants in long days.

1Received for publication Nov. 18, 1981. Oklahoma Journal No. 4065.
2Former graduate student and professor respectively at the Oklahoma Agriculture Experiment Station in Stillwater, Oklahoma. Appreciation is expressed to Garry Sites, greenhouse superintendant, for help in plant production, to Ron McNew, statistics, for aid in statistical analysis, and to Earl J. Small Growers, Pinellas, Fla. for seedling plants.

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Table 1. Effects of Photoperiod and Pinching on first and second flowering, final plant height, above-ground dry weight and tuber fresh weight.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Plants flowering' (%)</th>
<th>Mean No. days to 1st flower&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Mean No. days to 2nd flower&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Mean diam. of 1st flower&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Mean diam. of 1st flower&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Mean final plant ht (cm)</th>
<th>Mean final dry wt (g)</th>
<th>Mean final tuber fresh wt (g)&lt;sup&gt;c&lt;/sup&gt;</th>
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<tr>
<td>9 hr day</td>
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<tr>
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<td>37.2</td>
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<td>45.5</td>
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Significance of main effects and interaction

Source of variation

Photoperiod     **     **     *     NS     **     **     **
Pinching         **     **     **     NS     *     NS     NS
Photoperiod x Pinching NS     NS     NS     NS     NS     NS     NS

1Percent of the total plants (24) in each treatment that reached first or second flowering.
2Means of plants that reached first or second flowering during 11-week period March 12 – May 28.
3Final data recorded May 28. 11 weeks from start of experiment.
4No interaction in the 3 long day treatment (None of the 9 hr day pinched plants flowered).
5NS, *, **Non significant (NS) or significant at 5% (*) or 10% (**) level by F test.

Regulation of Growth and Flowering in Basket of Gold, *Aurinia saxatilis* (L.) Desv<sup>1</sup>

Karen G. Shedron<sup>2</sup> and Thomas C. Weiler<sup>3</sup>

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Additional index words: vernalization

Abstract. Cold storage for a minimum of 12 weeks induced flowering of *Aurinia saxatilis*. Seedlings became receptive to cold induction of flowering only after reaching the stage of 10 cm diameter containers.

The binomial of the herbaceous perennial, *Aurinia saxatilis* (2), has not been widely accepted, and in most instances the plant is still erroneously called *Alyssum saxatile* (1). It is commonly called basket-of-gold, goldentuft, madwort, goldentuft alyssum, gold-dust, or rock madwort (1-4). This plant flowers in spring and assumes a sprawling habit in rich or moist soils or shady conditions (3). There are no published data on the requirements for flower development. Studies began in 1977 toward the development of an efficient production program.

All plants were germinated from *Aurinia saxatilis* ‘Compacta’ seed sown in peat-lite