Critical Daylength for Inflorescence Formation of Several Cultivars of *Salvia splendens* Sello[1]

T. C. Weiler and C. H. Lai[2]
Purdue University, Lafayette, Indiana

Abstract. **In daylength-responsive salvia cultivars long photoperiods delayed flowering and increased height. The critical daylength was 15 - 16 hours, and above this, the response was proportional to daylength.**

With incandescent light extensions of the day, salvia cultivars often respond as short day (SD) plants (1, 2, 3, 5, 7, 8, 9, 10). The exceptions have been 'St. John's Fire', in which flowering time is reduced by long days (LD) (4, 5, 10), but the no. of nodes is unaffected by daylength (10), and cultivars which are insensitive to photoperiod (10).

Nightingale (7) observed growth and flowering differences in *S. splendens* 'Compacta' using a 7 hr day and 17 hr day (daylength extended by low intensity incandescent light). With various cultivars, others observed a SD response with daylengths ranging from 5 to 12 hr and a LD response from 16 to 24 hr (1, 2, 3, 7, 8, 9, 10). Long day response also was observed after light interruption of nights (5).

Arthur, Guthrie, and Newell (1) reported the critical daylength of a nonspecified *S. splendens* selection to be between 12 and 17 hr in growth rooms lighted at 0.22 Langley/min by tungsten-filiament lamps for 5, 7, 12, 17, 19 or 24 hr/day. In this study we report the critical daylength of several salvia cultivars using low-intensity incandescent lighting after 8 hr of sunlight.

'Fireball', 'St. John's Fire', 'Red Pillar', 'Firebrand', and 'Bonfire'[3] seeds were germinated in a 21°C dark cabinet; greenhouse-grown in natural daylengths until 3 nodes were initiated; transplanted; and placed in 8, 10, 12, 14, 16, 18 or 24 hr daylengths in a greenhouse. All plants received 8 hr sunlight before blackcloth covering, and incandescent light of approx 0.002 Langley/min extended the daylength. Common cultural practices (6) were used. For the initial experiment, seeds were sown Jan. 7, 1971, and grown at 16°; in a 2nd experiment the seeds were sown June 16, 1971, and grown at a minimum of 21°. There were 10 plants per treatment. Plant height was measured from the soil line to the top vegetative node and the date the inflorescence became visible was designated the budding date.

Only the results of the 2nd experiment are reported (Fig. 1), but the trends for both experiments were the same. The differences between daylengths were highly significant, though less in the initial experiment, perhaps because cool growing temp reduced the response to daylength (8, 9, 10).

As in previous work (10), 'Bonfire', 'Red Pillar', and 'Firebrand' were greatly affected by photoperiod while 'St. John's Fire' and 'Fireball' were not (Fig. 1). In the daylength-responsive cultivars the critical daylength for inflorescence formation was between 14 and 16 hr, but for height was 14 to 18 hr. These ranges were narrower than those reported by earlier workers (1), but in agreement with their findings. Low-intensity incandescent lighting was sufficient for determinations of critical daylength.

The greater the period of light in LD, the greater was plant height, the no. of nodes, and the retardation of flowering. A 24-hr light period maximized the LD response.

The critical daylength was the same for all the daylength-responsive cultivars (Fig. 1) which suggests that one photoperiodic mechanism was involved in the selection of tall, late-flowering cultivars.

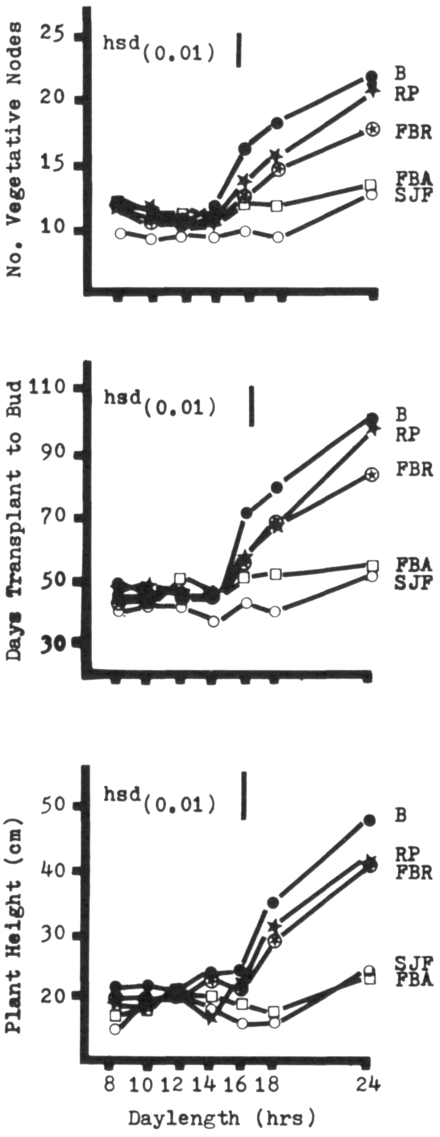

Fig. 1. The influence of several daylengths on no. of nodes, forcing time, and plant height of 'Bonfire' (B), 'Red Pillar' (RP), 'Firebrand' (FBR), 'Fireball' (FBA) and 'St. John's Fire' (SJF).

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[2]Assistant Professor and Graduate Research Asistant, Department of Horticulture.

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