Heading and flowering of perennial forage grasses under greenhouse conditions during the winter months are dependent upon the three major environmental factors of daylength, temperature, and soil fertility (1, 2, 3, and 5). Variations in regularity of heading among and within some species may be attributed to differences in greenhouse temperatures prior to or during long-day treatments. Newell (4) has reported that panicle production in smooth bromegrass depends on subjecting plants to short days and cool temperatures before increasing the length of the photoperiod.

Two experiments were conducted to determine the effect of temperature on the initiation of floral primordia, interval to heading, and the number of panicles produced in orchardgrass, *Dactylis glomerata* L., meadow fescue, *Festuca elatior* L., smooth bromegrass, *Bromus inermis* Leyss, reed canarygrass, *Phalaris arundinacea* L., and timothy, *Phleum pratense* L. The results are discussed from the standpoint of practical greenhouse management.

**MATERIALS AND METHODS**

In the first experiment, four early- and four late-maturing orchardgrass clones were studied; in the second experiment, two each of these same clones were included in addition to one early and one late clone of each of four other species. Plants were brought into the greenhouse in early September and divided into individual tillers that were rooted in running tap water and planted singly in 4-inch glazed crocks. The tillers were kept at 65°F until well established (approximately 10 weeks) after which they were grown at several temperatures. In the first experiment, were grown under greenhouse temperatures of 50°F during the short days, and then with combinations of 75°F to 80°F during long days. In the second experiment, there were nine combinations as outlined in table 1. These were approximately 10 hours for the short days and 16 hours for the long days. Supplementary light was provided, furnishing 75 foot-candles at the soil surface. The short-day treatments were 40 days in the first experiment and 28 days in the second. The long-day treatments that followed were continued for 71 days. There were six replications in the first experiment and five in the second.

Records were taken on the time of initiation of floral primordia, interval to heading, and the number of culms that produced heads. Data on the initiation of floral primordia were obtained by dissecting the largest tiller from similar plants that were maintained under the same treatments. Heading or flowering dates were recorded for the first three culms in the first experiment and for the first five in the second. A culm was regarded as having headed when the panicle had completely emerged from the sheath of the last leaf.

**EXPERIMENTAL RESULTS**

In the first experiment, orchardgrass clones subjected to low temperatures under short days followed by high temperatures under long days headed most quickly. Early and late clones initiated floral primordia at the same time, namely 5 days after exposure to the 16-hour day-length. The average interval from initiation of floral primordia to heading was 17 days for the early clones and 24 days for the late clones.

In contrast with the treatment providing low temperatures after the high, continuous low temperature delayed the initiation of floral primordia on the average of 0.7 days for the early clones and 2.8 days for the late clones. The average intervals from initiation to heading were 31 and 41 days, respectively. Similarly, the average delay in initiation of floral primordia in clones grown...