

Flowering control of ornamental crops with LED lamps

Photoperiodic lighting from lamps with a moderate ratio of red [R (600–700 nm)] to far-red [FR (700–800 nm)] light effectively promotes flowering of long-day plants (LDPs). Because of spectral controllability, long life span, and energy efficiency, light-emitting diodes (LEDs) have emerged as an alternative to conventional light sources, such as incandescent (INC) and high-pressure sodium (HPS) lamps.

Scientists at Michigan State University coordinated grower trials with five commercial greenhouse nurseries to investigate the efficacy of R + white (W) + FR LEDs, with an R:FR of 0.82, to regulate flowering of daylength-sensitive ornamental crops (HortTechnology). Ageratum, calibrachoa, dahlia, dianthus, petunia, snapdragon and verbena were grown under natural short days (SDs) with 4-hour night-interruption (NI) lighting provided by the R + W + FR LEDs or conventional lamps typically used by each grower.

Two companies used HPS lamps, whereas the other sites used INC lamps. In addition, a natural SD treatment, a truncated 9-hour SD treatment, or a compact fluorescent lamp (CFL) NI treatment was provided at three different sites. With few exceptions, time to flower and flowering percentage of the bedding plant crops tested were similar under the R + W + FR LEDs to that under the conventional lamps at all sites. At MSU, ageratum, dianthus, petunia, snapdragon, and verbena flowered earlier under NI lighting treatments than under 9-hour SDs. In addition, plant height and visible flower bud or inflorescence number at flowering were similar under the R + W + FR LEDs and INC lamps for most crops. Therefore, we conclude that the R + W + FR LEDs are as effective as lamps traditionally used in greenhouses at controlling flowering of photoperiodic plants. ◆