LIP It!

Providing a limited inductive photoperiod (LIP) can produce compact long-day plants and energy-cost savings.

By Erik Runkle

An increasing number of greenhouse growers are providing artificial long days to induce flowering of their long-day plants during the spring. Many bedding plants and herbaceous perennials flower faster — or only — when the night length is less than 10 hours (meaning the day length is 14 hours or longer). To successfully interrupt the long night, growers can extend the day with light (day-extension lighting) or operate lamps during the middle of the night (night-interruption lighting).

Generally, growers provide long days until plants are in flower, or until mid-April, when the photoperiod is naturally long. However, most long-day plants do not require continuous long days to reach flowering. In other words, many plants can be induced to flower by only three to four weeks of long days. Once most plants have initiated flowering, buds will continue to develop even if subsequently provided with noninductive photoperiods.

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The Basic Idea

The concept of limited inductive photoperiod, or LIP, refers to providing plants with a short period of an inductive photoperiod followed by exposure to a noninductive photoperiod. For long-day plants, an LIP treatment would be to provide plants with a short (three- to four-week) duration of long days followed by short days.

Why might a grower use LIP? There are two potential benefits: reduced electricity costs and shorter, more compact plants. Electricity consumption can be reduced because lamps used to create a long photoperiod need to be operated for only a few weeks for many annuals and up to several weeks for some perennials. In addition, research has shown that plants grown under an LIP treatment are often shorter compared to plants grown under continuous long days. This is particularly true when growers use incandescent lamps to create a long day.

Approach with Caution

So why doesn't everyone use LIP? There are a few potential drawbacks. First, some plants produce more flower buds and flower slightly faster when provided with continual long days. Second, we know of one ornamental plant, *Asclepias tuberosa* (butterfly weed), that requires long days until flowers open. If plants with flower buds are exposed to short days, the flowers cease to develop and abort. It is likely that a few other ornamental plants will respond similarly.

The concept of LIP is usually applied during the winter and early spring when days are naturally short. During this time, crops are lighted for three or four weeks, or until flower buds are first visible. However, LIP can be employed when the days are naturally long if a blackout system is available. For example, long-day plants can be provided with natural long days in late April, and once plants are induced, a blackout system can be used to provide an artificial short day until plants are ready for market.

I encourage growers to experiment with LIP on a small scale to evaluate the pros and cons of the concept. To begin, growers may wish to provide three to five weeks of long days to long-day plants. Shorter durations may be effective on some crops. LIP probably has the most potential on facultative long-day plants, which are plants that benefit from, but do not require, long days for flowering. There is no effect of LIP on day-neutral plants, although some may be shorter under short days than under long days. Because plants grown with LIP can be shorter, lower rates of growth retardants may be needed. GPN

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