

Light —

Why Think About It Now?



By Roger C. Styer

One of the biggest topics I have been discussing with my clients for the past few years is the subject of light. Not just light for plant growth, but how long and how much light is needed for timing the flowering of various crops. This subject is of particular interest to growers in the South and West but is also becoming more important in the Midwest and Mid-Atlantic. It used to be that only Northern plug growers were using lights to grow plugs, but now you can find plug growers as far south as Southern California and Florida who are lighting plugs to initiate earlier flowering. And any grower who produces 'Purple Wave' petunias has grappled with the problem of getting them into flower before they take over their growing space.

I am also seeing growers load up their greenhouses with lots of baskets, not realizing what that does to the crops underneath. Growers are blocking some of the total light to crops below, as well as changing the light quality. Large baskets intercept more of the red light (which keeps the plant shorter and more branched) and let the far-red light pass through (which stretches the plant and delays flowering).

I think the introduction of Wave petunias, which is a great item for our industry, has brought this whole issue of lighting to the forefront and smacked many a grower in the face. You cannot just plant this crop on a certain schedule, not accounting for photoperiod and total light intensity, and expect it to flower when you want.

Additionally, if your competitor is bringing crops to market in flower and you are not, you lose shelf space and market share. On top of that, some of these crops are pretty vigorous and require more growth regulators to control them while you wait for flowering. Imagine what would happen if you ran an ad for that crop and missed it because the crop was not in flower!

WHY THE PROBLEMS?

The problems with light and flowering fall into the following categories: 1) scheduling too early; 2) too warm/wet; 3) unlighted plugs; and 4) hanging baskets over crops. Growers with early markets (before May 1) expect everything to be in

flower in February, March or early April. But they do not realize that a number of crops (Purple Wave petunias included) are long-day plants, which need at least 12 hours of light to initiate flowers. To have these crops in flower before mid-April, you need to light the plugs and maybe even light some of the finished crop. Generally, you can light long-day crops in the plug stage for a minimum of three weeks to initiate them, but if you transplant them into short days lasting more than a week or so, you will not get the flowering you want. Also, if you grow the crop in cold temperatures, it will not flower on time.

CROPS THAT BENEFIT MOST FROM LIGHTING PLUG TRAYS

Long Days	Short Days	Growth/ Earlier Flowering
Ageratum	African Marigold	Dianthus
Dahlia	<i>Salvia splendens</i> *	Fibrous Begonia
Lisianthus	<i>Zinnia elegans</i>	Geranium
Lobelia	Cosmos	Gerbera
Nierembergia		Impatiens
Pansy*		Penta
Petunia		Vinca
<i>Salvia farinacea</i>		
<i>Salvia splendens</i> *		
Snapdragon (mid-size and taller)		
Tuberous Begonia		
Verbena		
Viola*		

**Not all varieties*

To solve the problem of getting long-day crops to flower earlier, many growers either light their own plugs or ask for lighted plugs from their suppliers. However, not all long-day crops respond the same way. You can group long-day crops as either obligate long-day or facultative long-day. Obligate long-day crops can be initiated in the plug stage with night-interruption lighting for a period of three weeks. Transplanted into several weeks of short days or cold weather, they may need some additional night-interruption lighting to initiate and flower. Facultative long-day crops will flower faster with longer days but react more to total light. These crops include gerbera, geraniums, dianthus and Purple Wave petunias. If you want to speed up their flowering, you should use day length extension with HID lights. Generally,

growers turn on the lights at sunset and turn them off at midnight, providing 16-18 hours of photoperiod but, more importantly, more total light. On cloudy days, lights are turned on if inside light levels drop below a certain point.

Just to throw a monkey wrench into this whole scenario, some crops need a certain number of leaves showing before they will initiate flowers, a juvenility factor. Purple Wave petunias will initiate flowering when lit between the 5th and 12th true leaf stage. This juvenility requirement may force growers to light certain crops after transplanting for a couple of weeks to finish the initiation process started in the plug tray.

Another problem with getting plants into flower results from growers keeping crops too happy. By that I mean they overwater, overfeed and overcrowd. Overwatering results in more shoot growth, less root growth and few flowers. Overfeeding, especially with fertilizers high in NH₄, promotes shoot growth and not flowers. Overcrowding forces plants to stretch, again promoting shoot growth and preventing flowering. New Guinea impatiens is a favorite example. You need to stress this crop to flower, as well as to control its growth. Baskets hanging above flower faster and grow shorter than pots below due to more stress on the plants.

There is a lot of good research and information coming out now that will help growers make intelligent decisions about flowering. Jim Faust is developing the concept of DLI (daily light integral), which is a measurement of total light that the plant receives. This will be important when put into a model to determine how to predict plant growth and flowering. John Erwin, Paul Fisher and the Michigan State University group are separately putting out information on lights, lighting, photoperiod and total light needed for flowering. Growers need to keep up with this research to see how to change methods and schedules. After all, there seems to be more "light" being shed on this topic than ever before! [GPN](#)

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