

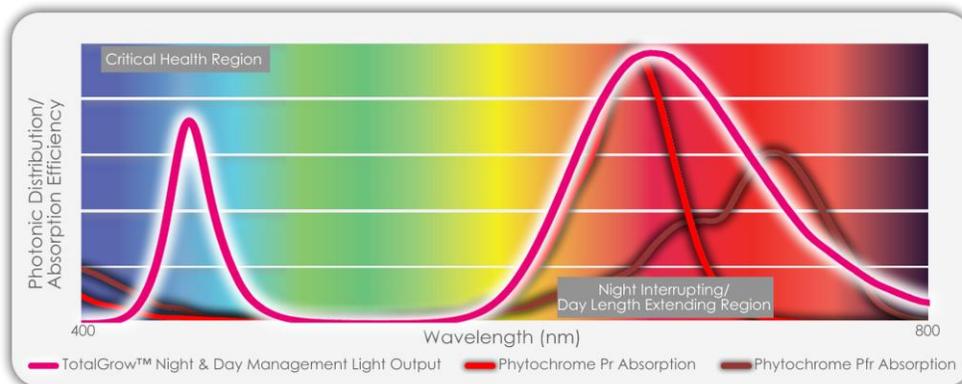
TotalGrow™ Night & Day Management Light



The most efficient and effective solution for simulating long days to control the timing of flowering.

- Perfect balance of deep red and far red light output for night interruption/day length extension
- Sufficient blue light output to prevent stretching and promote compact, vibrant growth
- Virtually no wasteful generation of green light that is ineffective for day length management

The Science of Plant Night & Day Management



- Long or short day perception often triggers or prevents key behaviors, especially flowering.
- Long days require the appropriate lighting spectrum extending the day before sunrise/after sunset or interrupting the night, e.g. 10pm – 2am.
- This spectrum must properly stimulate the photoreceptor phytochrome with red (esp. 620-690nm) and far red (esp. 690-750nm) light in a ratio of 0.5:1 to 2:1.¹ However, higher far red proportions induce stretching at the expense of leaf growth.²
- Blue light prevents stretching³ and is vital to proper nutrient stimulation, gas exchange and other gross morphological functions.⁴

¹ Craig, D. S., & Runkle, E. S. (2013). A Moderate to High Red to Far-red Light Ratio from Light-emitting Diodes Controls Flowering of Short-day Plants. *JASHS*, 138(3), 167-172.

² Cerdán, P. D., & Chory, J. (2003). Regulation of flowering time by light quality. *Nature*, 423(6942), 881-885.

³ Runkle, E. S., & Heins, R. D. (2001). Specific functions of red, far red, and blue light in flowering and stem extension of long-day plants. *JASHS*, 126(3), 275-282.

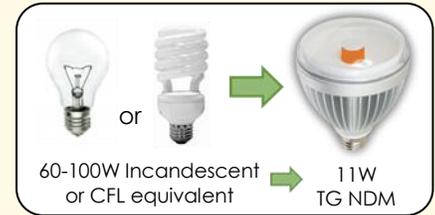
⁴ Folta, K. M., & Childers, K. S. (2008). Light as a growth regulator: controlling plant biology with narrow-bandwidth solid-state lighting systems. *HortScience*, 43(7), 1957-1964.

Item	TG1A	
Product Type	Light Bulb	
Power Consumption	11W	
Projected Service Life	20,000 hours	
Output Efficiency	1.3 µmole/J	

contact: info@venntis.com

TotalGrow™ Night & Day Management Light Usage Guidelines

1. Directly replace 60-100W incandescent or their CFL equivalents.
2. For new bulb installations, install lights on approximately 8' – 10' centers.
3. Hang heights should be at least 2/3 of the distance between bulbs (e.g. 6' high for 9' spacing). Hang lower and closer together in smaller installations (e.g. 10 bulbs) for improved light localization and higher in large installations (e.g. 200+ bulbs) for maximum uniformity.



Light Level	Spacing	Min. Height
Optimum	8'x8'	5'
Standard	10'x10'	6.5'
Exceptions*	12'x12'	8'

*Some plants are very easily stimulated.

Competition Analysis

Incandescent

- High energy costs
- Insufficient red and especially blue light output to prevent stretching
- Burns out quickly & easily broken

Fluorescent

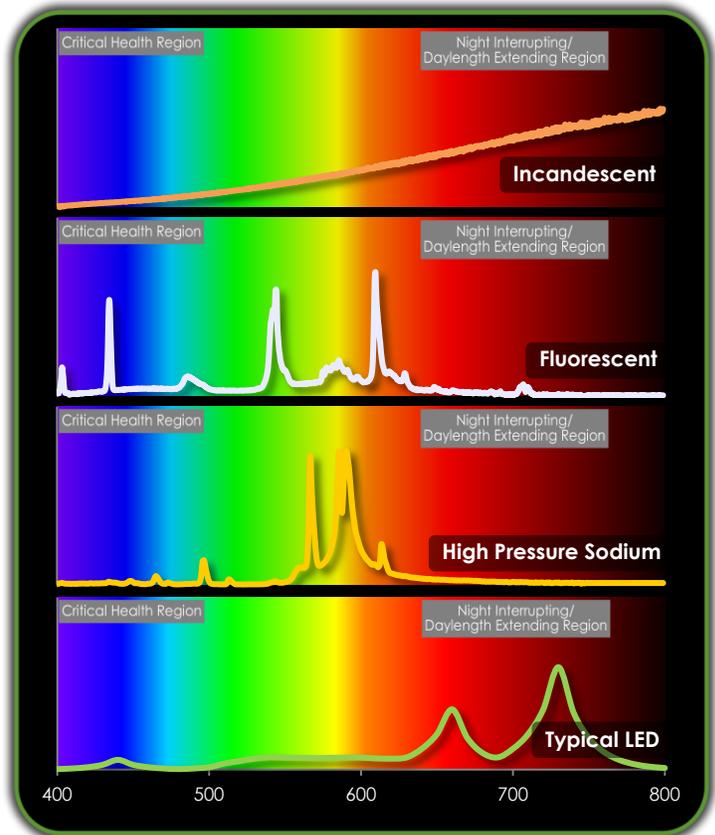
- Insufficient red and especially far red light output for effective day length control
- Reduced efficiency and lifetime
- Toxic mercury vapors in easily broken glass

High Pressure Sodium

- Insufficient red and especially far red light output for effective day length control
- Insufficient blue light output for healthy growth without stretching
- High powered bulbs waste light in high-intensity hot spots

Typical LED

- Rely on far red LEDs with far lower efficiency
- Generally lacking blue light output for healthy growth without stretching
- Directional LEDs create poor lighting uniformity, requiring extra lights or creating inconsistencies
- Require multiple different LEDs to approximate a desired spectrum often resulting in color separation



Features

- Best complete spectrum for flowering control
- Peak red and far red output for day length management, enhanced blue output for plant health enhancement
- The most efficient generation of far red light
- Excellent output uniformity with minimal light spillage
- No toxic heavy metals
- High durability
- Long lifetime

Benefits

- Saves up to 90% of energy costs
- Consistent flowering and growth control
- Dense, vibrant, lush growth
- Safety from mercury vapors and broken glass; environmentally friendly
- Low maintenance