

2009 National Floriculture Career Development Event

Problem Three

Assume you are asked to assist a customer plan and develop an interior plantscape in his 24 foot by 30 foot real estate office with 10 foot ceilings and window lighting. The customer wants both blooming and forage plants.

Use the lighting information provided and your common knowledge to choose the group of recommendations you would make to the customer.

- A.
 - 1. Recommend a lighting intensity of 100-200 foot candles
 - 2. Recommend soil leaching for plants
 - 3. Recommend reducing the watering rate and interval
 - 4. Recommend the office temperature be kept between 65 and 75° Fahrenheit
 - 5. Recommend incandescent lighting
- B.
 - 1. Recommend a lighting intensity of 100/200 foot candles
 - 2. Recommend soil leaching for plants
 - 3. Recommend reducing the watering rate and increasing the interval
 - 4. Recommend the office temperature be kept between 65 and 75° Fahrenheit
 - 5. Recommend cool white fluorescent lighting
- C.
 - 1. Recommend a lighting intensity of 100-200 foot candles
 - 2. Recommend soil leaching for plants
 - 3. Recommend reducing watering rate and interval
 - 4. Recommend the office temperature be kept between 65 and 75° Fahrenheit
 - 5. Recommend wide spectrum plant growth lights
- D.
 - 1. Recommend a lighting intensity of 50-100 foot candles
 - 2. Soil leaching for plants not recommended
 - 3. Recommend increasing watering rate and interval
 - 4. Recommend the office temperature be kept between 65 and 75° Fahrenheit
 - 5. Recommend incandescent lighting

Table 24-2 A Comparison of Artificial Lighting Sources for Interior Plantscapes

Lamp Type	How Light Is Produced	Quality of Light Produced	Percent of Visible Light Radiation	Color Rendition	Initial Cost	Operating Cost	Life of the Lamp	Placement Height Above Plants	Plant Responses	Major Advantages	Major Disadvantages
Incandescent (all types)	Current flows through a tungsten filament heating it and making it glow.	High in red light; low in blue light	7-11	Good	Low	High	750 to 2,000 hours	At least 3 feet to avoid foliage burn	Plants become long and spindly with pale foliage. Flowering is promoted, and senescence is accelerated.	<ul style="list-style-type: none"> • Good for special lighting effects • Compact source of light • Simple installation 	<ul style="list-style-type: none"> • Energy inefficient; too much lost as heat • Light does not distribute evenly over a surface. • Glass blackens with time and light output is reduced. • Frequent replacement is needed.
Cool White Fluorescent	Phosphor coating inside the glass tube is acted upon by radiation from a mercury arc.	High in blue and yellow-green light; low in red light	22	Good (blends with natural daylight)	Moderate	Moderate	Up to 20,000 hours	10 feet or less	Plants stay short and compact. Side shoots develop. Flowering extends over a longer period.	<ul style="list-style-type: none"> • Energy efficient • Heat is radiated over the length of the lamp, allowing closer proximity to plant foliage. • Light distributed more evenly over a flat surface 	<ul style="list-style-type: none"> • Light does not focus well. • They are difficult to start when line voltage drops or humidity is high. • Installation is expensive. • Special fixtures are needed.
Warm White Fluorescent	Phosphor coating inside the glass tube is acted upon by radiation from a mercury arc.	Low in blue and green light; more yellow and red light	22	Poor (blends with incandescent light)	Moderate	Moderate	Up to 20,000 hours	10 feet or less	Same as CW fluorescent	<ul style="list-style-type: none"> • Same as CW fluorescent 	<ul style="list-style-type: none"> • Same as CW fluorescent
Fluorescent Plant Growth Lamps	Same as other fluorescents. Special phosphors transmit most light energy in blue and red light regions of the spectrum.	High in red and blue light; low in yellow-green light	22	Average (enhances red and blue colors; darkens green colors)	Moderate	Moderate	Up to 20,000 hours	10 feet or less	Rich green foliage color. Large leaf size. Side shoots develop. Plants stay short. Flowering is delayed.	<ul style="list-style-type: none"> • Same as CW fluorescent • Light emission is from the region of the spectrum most important to photosynthesis. 	<ul style="list-style-type: none"> • Same as CW fluorescent • Greater expense with little increase in benefit to the plants
Wide Spectrum Plant Growth	Same as other fluorescents. Special phosphors transmit most light energy in blue and red light regions of the spectrum.	Less blue and red than standard plant growth lamps; more far-red and yellow-green light	22	Average (favors red and blue colors; darkens green colors)	Moderate	Moderate	Up to 20,000 hours	10 feet or less	Stems elongate. Side shoots are suppressed. Flowering is promoted. Plants age rapidly.	<ul style="list-style-type: none"> • Same as CW fluorescent 	<ul style="list-style-type: none"> • Same as CW fluorescent • Growth may not be desired. • Poor color rendition on nonplant materials
Mercury Deluxe white model, for interior plants)	An electric arc is passed through mercury vapor.	High in yellow-green light; less red and blue light, but still usable for plant growth	13	Poor (favors blue and green colors)	High	Moderate	Up to 24,000 hours	10-15 feet or more	Plants respond in a manner similar to CW fluorescent.	<ul style="list-style-type: none"> • Long life; useful for inaccessible fixtures • Medium energy efficiency 	<ul style="list-style-type: none"> • Not interchangeable with other lamps • Warm-up time required
Metal Halide	Similar to mercury lamps but with metal gas additives to produce a different spectrum	High in yellow-green light; less red and blue light, but still usable for plant growth	20-23	Good (similar to CW fluorescent)	High	Low	Up to 20,000 hours	10-15 feet or more	Plants respond in a manner similar to CW fluorescent.	<ul style="list-style-type: none"> • High energy efficiency, surpassing the mercury lamp • Good for both plant and general lighting 	<ul style="list-style-type: none"> • Warm-up time required • Color and light quality change with operating hours.

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