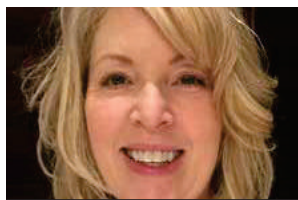


What's the affect of light on plants?



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Ask a Master Gardener

Question: Now that it is winter and there is less daylight, I am curious as to how this change in light affects plant growth. And specifically, why is my Christmas cactus blooming while other plants are not?

Answer: It is interesting how plants differ in their bloom cycles and their responses to light. Light plays a critical role in a plant's growth and bloom cycle. More specifically there are three principle characteristics of light that affect growth – quantity, quality and duration.

The quantity of light refers to the intensity or concentration. This is where the seasons come in to play, more sunlight in the summer (maximum) and less in the winter (minimum). Generally, the more sunlight a plant receives the greater its capacity for producing food through photosynthesis – the process in green plants of converting carbon dioxide and water into food (sugars and starches) using the energy from sunlight.

However, there are ways you can manipulate the quality of the light to achieve different plant growth, such as increasing the light around a plant by surrounding it with reflective materials, a white background or supplemental lights. Or you can decrease the amount of light by shading plants with woven shade cloths.

The quality of the light refers to the color,



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Strawberries are day-neutral plants and will form flowers no matter the length of day.

or wavelength, of light. Sunlight provides the complete range of wavelengths, which can be separated by a prism into the bands of red, orange, yellow, green, blue, indigo and violet. Plants absorb the light and, through photosynthesis, convert it into energy.

But not all wavelengths are used equally; blue and red light has the greatest effect on growth – blue is primarily responsible for leaf growth and, combined with red, it encourages plants to flower. The light absorbing molecules in the plants are called pigments and they absorb only specific wavelengths while reflecting others.

The reflected light is what we see as color. Plants appear green to us because that is the light they are reflecting instead of absorbing. Understanding the quality of light your plant is receiving is important for ensuring good growth and flower production.

Fluorescent light is high in the blue

wavelength, so it encourages leafy growth and is an excellent light for starting seedlings. Incandescent light is high in red and orange wavelengths but generally produces too much heat to be a valuable source of light for plants.

The third characteristic is duration, or photoperiod, and is the amount of time a plant is exposed to light. As defined by Wikipedia, photoperiodism is the physiological reaction of organisms to the length of day or night. It occurs in both plants and animals.

Depending on their specific responses to photoperiods, plants are classified into three groups: short-day (long-night), long-day (short-night) and day-neutral plants.

Short-day plants form flowers only when the length of day is less than 12 hours. Many spring and fall flowering plants fall into this group, which includes your Christmas cactus, as well as chrysanthemum and poinsettia. Long-day



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Chrysanthemums are an example of short-day plants, which will only form flowers when the length of day is less than 12 hours.

plants form flowers only when the length of day is greater than 12 hours. This group includes most summer blooming plants and many vegetables such as beet, radish, lettuce, and spinach. The third group, day-neutral plants, will form flowers no matter the length of day. Examples of plants in this group are corn, tomato, cucumber, and some strawberry cultivars.

As with quantity and quality, the duration can also be manipulated.

To encourage flowering in short-day plants you can encourage them to bloom in the summer by covering them with a cloth to completely block out the light for 12 hours each day. After several weeks of artificial darkness, the plant will bloom as if it was spring or fall. This method is used to encourage poinsettias to bloom for Christmas.

To encourage a long-day plant to flower when the day length is less than 12 hours, expose it to

supplemental light, and after a few weeks, it will form flower buds. As the days begin to get longer your Christmas cactus will stop blooming, but you will begin to see new growth in other plants and blooms will appear in spring.

Do you have a gardening question? Email, call, or visit the Douglas County Master Gardener Plant Clinic at douglasmg@oregonstate.edu, 541-672-4461, or 1134 S.E. Douglas Ave., Roseburg.