CENTRO HISPANOLUSO DE INVESTIGACIONES AGRARIAS

VNiVERSiDAD D SALAMANCA

Salamanca, May 22nd, 2012

Att. Mr. Alberto Alonso Lobo

Re. *Far infrared light and plant growth*

Among the electromagnetic radiations, the infrared light (IR) has the inmediate longer wavelength (750 nm-1 mm) than the visible light. The IR zone of the electromagnetic spectrum is divided into three segments by wave frequencies and wavelengths: near (NIR): 0.75- 2.5 µm; middle (MIR): 2.5-10 µm; and far (FIR): 10-1000 µm. These waves have different effects on life. NIR waves heat organic substances, the surface gets hotter than the interior, and the interior gets heated by conduction from the surface. FIR are the safest and the most beneficial, penetrating deeply with a very uniform warming effect. IR is absorbed by cells, but the energy that it contains is too low to excite electrons and most of this energy is immediately converted to heat.

Plants are dependent upon sunlight for photosynthesis. We know that energy from the sun's rays controls vital processes in plants and the greatest amount of the sun's energy output is in the IR segment of the spectrum. Most plants can survive without flowering, the species would be lost without the IR spectrum in sunlight. When plants are grown indoors may grow well under fluorescent lights, but will not bloom until appropriate levels of IR radiation have been introduced. IR waves affect the speed at which plant stems grow and a combination of FIR and red light produces the longest internodes. While the chlorophyll in plants reflects NIR waves, plants use FIR rays in photosynthesis. However, plants grown in light that is too red may seem spindly and long-stemmed since too much IR light may cause plants to experience early growth spurts that reduce their health, or encourage them to flower too soon.

FIR also triggers in the plant the production of ethylene, a gaseous hormone that regulates fruit ripening, flowering opening, flower and leaf senescence, and stimulates shoot and root growth and differentiation, and the release of dormancy. As a result, FIR can cause damage to plants when this technology is not properly applied. However, the right use of FIR is beneficial to plants, for correct blooming, flowering, stem growth and photosynthesis, mainly in indoor gardening and horticulture production.



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