Infrared in Agricultural use

Short Summary

- Infrared heaters are mainly use for heating up the environment when it is too cold.
- The alternatives heating sources are boilers, fans, heated underground pipes etc.
- There are 2 benefits using Infrared heaters:
    - Initial startup costs / capital layout much cheaper than large systems, but the running cost per hour could be higher
    - Does not dry out the air like conventional fans
- It does have some specific uses on plant growth e.g. blooming etc.
- Photosynthesis mainly use the visible spectrum of light

Two of our heaters models are specifically used for greenhouses

- **G2 1500 / 2000 Ruby** – More economical option, higher red spectrum
- **G2 1500 / 2000 ULG** – Higher heat output and more yellow spectrum

Area Covered: Each of our 1500 / 2000 watt heater covers and effective area of about 4 x 4 meter when installed on a height of between 2.5 m and 2.8 meter

Benefits of using Striking Infrared heaters:

- the only heater in SA covered by a 5 year warranty - you buy the best quality!
- will not rust, chip or flake because its made entirely of aluminium and stainless steel. This is especially required in a agricultural environment
- Locally manufactured, spare parts and lamps always available
- Cost effective use of electricity due to our uniquely design reflector. Most of the electricity is projected forward as heat.

Technical details

Understanding light and photosynthesis

Sunlight contains 4% ultraviolet radiation, 52% infrared radiation and 44% visible light.

Chlorophyll does not absorb all the wavelengths of visible light equally. Chlorophyll a, the most important light-absorbing pigment in plants, does not absorb light in the green part of the spectrum. Light in this range of wavelengths is reflected. This is the reason why chlorophyll is green and also why plants (which contain a lot of chlorophyll) are also green. Note in the graph above that the absorption of light by chlorophyll a is at a maximum at two points on the graph 430 and 662 nm. The rate of photosynthesis at the different wavelengths of visible light also show two peaks which roughly correspond to the absorption peaks of chlorophyll a. Plants do not depend only on chlorophyll a in their light harvesting machinery but also have other pigments (accessory pigments) which absorb light of different wavelengths.

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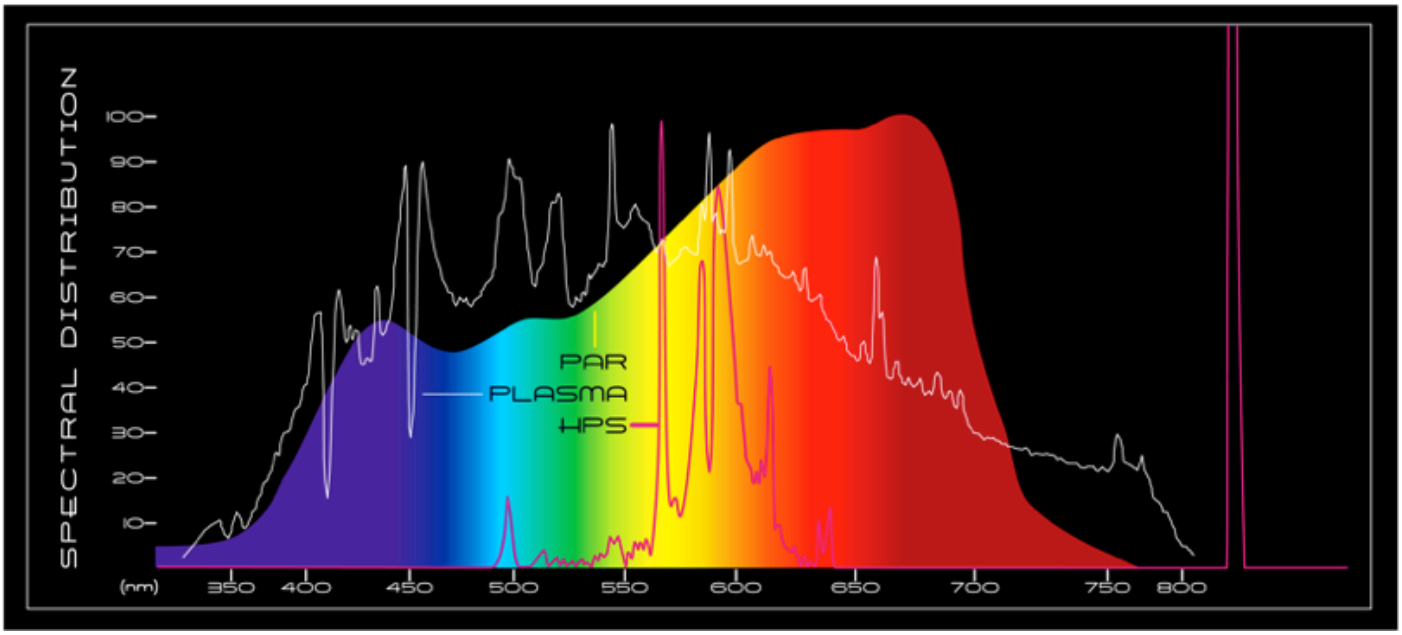

HPS – High Pressure Sodium
PAR – Photosynthetically Active Radiation - Spectrum of Light Utilized by Plants

The Effect of Infrared Light on Plant Growth

Infrared light is part of the electromagnetic spectrum. Technically, it is outside the range of light visible to the unaided human eye. According to NASA, infrared waves lie between the visible light spectrum and microwaves. The closer the waves are to the microwave end of the spectrum, the more likely they are to be experienced as heat. Infrared waves can also affect how plants grow.

Blooming

According to Texas A&M University, infrared light plays a part in the blooming of flowering plants. Plants grown indoors may grow well under fluorescent lights, but will not bloom until appropriate levels of infrared radiation have been introduced. This can be done using special horticultural lights, or simply by adding incandescent light bulbs.

Stems

According to Planta, increased infrared waves can affect the speed at which plant stems grow. A short exposure to far infrared light increased the space between nodes when the exposure occurred at the end of an eight-hour light period. Exposing the plant to ordinary red light reversed this effect. A combination of far red and red light produced the longest internodes. Plants grown in light that is too red may seem spindly and long-stemmed.

Damage

Too much infrared light, especially in the far red end of the spectrum, may actually damage plants. Heat may discolor or kill plants, especially if those plants haven't recently been watered. Too much infrared light may also cause plants to experience early growth spurts that reduce their health, or encourage them to flower too soon.

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Sources / Further reading

http://www.ehow.com/about_6744341_effect-infrared-light-plant-growth.html
http://www.botany.uwc.ac.za/ecotree/photosynthesis/spectrum.htm#middle
http://chameleongrowsystems.com

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