# Illumitex Increases Efficiency and Efficacy of Poinsettia Production

Global agriculture company Syngenta wanted to replace the outdated, expensive and energy-inefficient incandescent lighting it used to inhibit flowering of poinsettias at its Kenya Cuttings facility. Illumitex worked with Syngenta at the Kenya Cuttings facility to design and manufacture a purpose-built LED grow light fixture, Safari, to supply photoperiodic night interruption lighting and manage flowering schedules.

## Lighting Needs

Poinsettias are short-day plants that flower when the photoperiod, or day length, is shorter than approximately 12 1⁄4 hours or less (varies by varietal). It is well understood that low levels of light in the 660 nm (red) wavelength will inhibit flowering when used to extend the plant's perceived light period. Traditionally, incandescent or fluorescent lighting with a low intensity has been used to supply the required light. However, only a fraction of the total light spectrum emitted by incandescent lamps is required, which results in an inefficient use of energy and over-utilization of capital equipment. Innovative growers seeking to optimize their operations have begun using LED lighting that generate light exclusively in a small fraction of the light spectrum that peaks at 660 nm. Illumitex has provided LED lighting for this purpose to large scale growers of short day flowering plants with conclusive evidence of its effectiveness.

## Trials

Kenya Cuttings undertook a production trial over a period of 4 months with approximately 12,500 plantings. In each greenhouse bay, Illumitex replaced 39 150-watt incandescent lamps and 12 fluorescent lamps with 32 LED fixtures.

The Kenyan project required very low intensities of 660 nm light with high uniformity, and full coverage of the plant growing floor.

Using the specified light intensity and greenhouse geometry, we configured 32 of our proprietary Safari LED fixtures to provide a completely uniform light level over the entire bay growth area.  The fixtures have a life of more than 25 times the life of incandescent lamps, and are virtually maintenance free. They are IP66 ingress protection rated against dust and moisture, meaning humidity is not a concern, and they can be washed with a strong water spray.


## Plant Production Results

The project was closely monitored and measured.The trials resulted in a total of six premature bract flowerings, or approximately .49 plants per thousand. The cuttings production manager suspects lighting edge effect or other anomalous issues were the cause of the six premature flowerings, which would likely be corrected when contiguous lighting (between bays) is in place. The photometric design and model proved accurate, with the actual results meeting or exceeding the model expectations. Qualitative results were slightly improved when looking at the average uniform response curves per bag when compared to incandescent and offered significantly higher average uniform response

curves when compared to compact florescent lighting. Additionally, the cuttings production manager noted anecdotal observations of more "robust" plants. The trials appear to have met or exceeded all expectations.

## Energy Savings and Total Cost of Ownership

Syngenta saw a total energy cost reduction of 96%, as compared to the incandescent system replaced by the Illumitex LED grow lights. Maintenance costs, too, were greatly reduced. Total cost to replace an incandescent lamp averaged $5.32, or $118.50 per bay, each year. By comparison, the installed LED lights had no maintenance requirements during the trial. The LED lights are solid state construction and generally have nominal failures during the stated lifetime of 30 years (actual LED lifetime is 205 years). Using the same electric and diesel costs for the LED lights resulted in a total energy cost of $8,883, or a reduction of 96%. The return of the initial capital expense, or payback, is 1.16 years compared to incandescent and 2.01 years when compared to CFL. Getting poinsettias to market at just the right flowering stage is critical. Illumitex grow lights helped Syngenta do just that efficiently and effectively.

## Case study job specifics

**Customer**: Syngenta AG
**Sector**: Horticulture
**Plant/Crop**: Poinsettias
**Location**: Nairobi, Kenya
**Solution**: Illumitex Safari LED grow lights
**Results**: Flowering activity of plants more closely controlled