PHILIPS

Horticulture
LED solutions

GreenPower
LED flowering
lamp

Case study

Esmeralda Farms

La Tolita farm, Guayllabamba, Ecuador

Significant improvement in energy costs and lifetime

"The results give rise to a much better quality crop, more uniform plant growth and longer stems."

“After four months working with the LED flowering lamps, a 91% reduction in energy costs, **amounting to a total of US$ 18,000 was achieved.**”

Ruben Orozco, Director, Esmaralda Hilsea Investments of Guayllabamba

Peter Ullrich, Chairman, Esmeralda Farms

Background

The Esmeralda group is one of the largest and best-known growers of cut flowers in the world. The group operates farms in Peru, Ecuador, Colombia, Costa Rica, Mexico and Africa. In Ecuador there are nine Esmeralda farms covering 180 hectares and growing 32 different crops, including Roses, Gypsophilia, Hypericum, Aster, Solidago, Delphinium, Godetia. Esmeralda exports flowers to the USA (80%) and to the European market (20%). The group also operates a research department for plant breeding at Esmeralda Breeding.

La Tolita farm in Guayllabamba lies some 2,300 meters above sea level, where there is an average annual rainfall of 700 mm. Temperatures average around 17 °C (63 °F), with a maximum of 29 °C (84 °F) and a minimum of 7° C (45 °F). The farm devotes 1.5 (3.7 acres) hectares to Bupleurum, and 0.5 ha (1.3 acres) each to Dianthus and Lysimachia.

The challenge

The crops are grown outdoors in the open field and have until now been lit by 200-watt incandescent lamps. The challenge here was to reduce energy costs whilst maintaining the same high level of plant quality. With the crops being grown outdoors, breakage levels of the incandescent lamps were high, with the result that lamps had to be replaced frequently. The regular lamp breakages and the short lifetime of the lamps also had to be addressed. The LED trials started in 2013, with the main aim being to increase production levels (stems/m^2/year) and reduce production costs.

The solution

Once the best type of LED flowering lamp had been determined for each crop, Esmeralda Farms decided to go ahead and install the LED lamps right across the entire cultivated area, approximately 2.0 ha for these three crops.

For the Bupleurum crop, trials were carried out using both DR/W and DR/W/FR. The results showed that DR/W/FR gives rise to a much better quality crop, more uniform plant growth and longer

stems. Additional lighting was used for the Bupleurum crop from the time when the seedlings were transplanted up until the plants started flowering. That means the crop was lit for 10 weeks, with the full cycle lasting 12 weeks up until the crop was ready to be harvested.
In the case of Dianthus and Lysimachia, better results were achieved using DR/W. A little more time was required (one week longer), but this was offset by the savings on energy and the improved quality. For Dianthus, additional lighting was applied from the time when the seedlings were transplanted up until two weeks before the time of harvest. The total crop cycle lasted 14 weeks.
Lysimachia has a longer crop cycle of 19 weeks, and additional lighting was used with this crop from the time of transplanting up until three weeks before the harvest.

Benefits

After four months working with the LED flowering lamps, an outstanding 91% reduction in energy costs, amounting to a total of US$ 18,000, was achieved. This is equivalent to an energy saving of US$ 16.50/hour/hectare. It is estimated that the investment will be recouped within the space of 11 months.
The long lifetime and improved water resistance of the LED flowering lamps resulted in reduced labor costs, because now there is no need for the lamps to be replaced every day. Despite some periods of rain whilst the trial was being carried out, it was not necessary to replace any of the LED lamps during the crop cycle. Having installed the LED flowering lamps, Esmeralda can now rely on fast growth cycles irrespective of the season.
Having tried and failed to save energy in the past by using fluorescent lamps, Esmeralda Farms now plans to expand its Bupleurum crop and is going to install more LED flowering lamps to illuminate it.

“**The long lifetime and improved water resistance** of the LED flowering lamps resulted in reduced labor costs.”

Facts

Grower
Esmeralda Farms

Sector
Cut flowers

Crop
Bupleurum, Dianthus and Lysimachia

Location
La Tolita farm, Guayllabamba, Ecuador

Solution
Philips GreenPower LED flowering lamp

Philips LED Horti Partner
Fred C. Gloeckner & Company Inc.

Results
Significant improvement in energy costs and lifetime

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