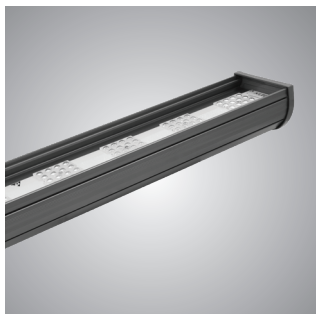




LED Plant Growth Light Catalog

English Catalog
Ver.2024 _____



LED GROW LIGHTS

English 2024

Introduction

Light and its various wavelengths are a crucial and fundamental aspect of agricultural and biological sciences, significantly impacting the growth and development of all organisms, especially plants and animals. Beyond its direct effects, light also plays a vital role in biological and physiological processes. Therefore, considering this factor in agriculture-related industries such as greenhouses, livestock farms, and poultry farms is indispensable. Light is a potential energy source for all living beings. The wavelength of light, representing the amount of energy present in the light, is the most important factor in the growth rate, development, and productivity of plants and animals. Today, humans can utilize this factor for specific purposes, whether domestic or industrial. For instance, red light enhances the longitudinal growth of plants as well as the development of flowers and buds, while blue light is effective for lateral growth and increasing plant resistance.

In greenhouses, the use of appropriate and controlled light can significantly improve plant growth and performance. Selecting the right light wavelengths can enhance the yield and quality of products. In fact, based on the type of plant and the production goal, artificial light can be used to increase productivity (both quantitative and qualitative). In livestock farming, appropriate lighting is essential not only for the growth and development of animals but also for regulating important biological activities. For example, by adjusting light at different times of the day and night and using specific spectra, milk production and quality can be improved.

In poultry farms, light with the appropriate wavelength can impact growth activities (hatching), egg-laying, and bird behavior. Additionally, controlling light can improve egg quality and weight and develop the breast and thigh tissues of broiler chicken.



LED Greenhouses

Today, due to crises like drought, flood, frost, and global warming, as well as rising energy costs, there's a growing need for an efficient method to cultivate agricultural products outside of season with minimal energy consumption. In this context, developing lighting systems that enable cost-effective production in greenhouses can be a solution to this problem and also promote sustainable production of agricultural products.

Traditionally used fluorescent and incandescent lamps in greenhouses, phytotrons, and plant incubators, besides producing unsuitable light for plant growth, have drawbacks like high power consumption, short lifespan, and containing environmentally harmful materials like mercury.

Another type of lamp used in plant and flower greenhouses are High-Intensity Discharge (HID) lamps. These lamps help plants grow faster by producing a higher light intensity. However, their disadvantages include high power consumption and generating significant heat that can burn nearby plants. Additionally, the red and blue light spectrum of these lamps, crucial for photosynthesis, isn't optimal.

Unlike the three types of lamps mentioned earlier, LED lamps offer an optimal solution for greenhouse lighting.

They efficiently produce the red and blue light essential for photosynthesis, leading to accelerated plant growth and remarkable improvements in both the quantity and quality of the produce. Additionally, as LED lamps belong to the category of «cool lamps,» they do not cause any burns to plants in close proximity.

This allows for both space saving and dense cultivation within the greenhouse environment.



Golnoor Company

Amidst the growing demand for sustainable and efficient agricultural practices, Golnoor, a leading Iranian company, has emerged as a frontrunner in promoting LED lighting technology for greenhouse cultivation. Driven by a deep commitment to environmental stewardship and technological innovation, Golnoor envisions a future where LED lighting revolutionizes the agricultural landscape, enabling the production of high-quality, fresh produce with minimal environmental impact and at reduced costs.

Recent research has overwhelmingly demonstrated the superiority of LED lighting in enhancing plant production and quality compared to traditional greenhouse and field cultivation methods that do not utilize LED lights.

Furthermore, an acceleration and increase in the rate of flowering, as well as an improvement in flower quality, were observed in numerous flowers.





Golnoor LED Lights

Key Capabilities of Golnoor LED Lights:

- 1 - Accelerated Plant Growth
- 2 - Enhanced Root Development
- 3 - Seed Germination and Early Growth
- 4 - Production of various sprouts and microgreens (wheat, mung bean, alfalfa, etc.)
- 5 - Vegetable and Herb Cultivation
- 6 - Fruit and Seed Production
- 7 - Improved Greenhouse Produce Quality
- 8 - Accelerated Flowering and Increased Blooms
- 9 - Enhanced Secondary Metabolite Production
- 10 - Increased Medicinal Compounds, Vitamins, and Antioxidants
- 11 - Tree lighting and increasing their resistance to environmental stresses (drought, salinity, nutrient deficiency, etc.)
- 12 - Increasing the shelf life and post-harvest longevity of various cut flowers, fruits, and vegetables



Types of LED Lights

Types of LED lights designed by the Glonoor company for use in greenhouses, growth chambers, livestock farms, poultry farms, and office/residential environments are listed at the end of this text. Additionally, the results of using LED lights on various plant products and yields are presented below.



— Vegetable, Herb, and Greenhouse Crop
Production

— Flower and Ornamental Plant Cultivation

— Medicinal Plant Cultivation.

— Animal Sciences



Production of Vegetables, Herbs, and Greenhouse Crops

Vertical Farming with LED Lights: A Revolutionary Approach to Urban Agriculture

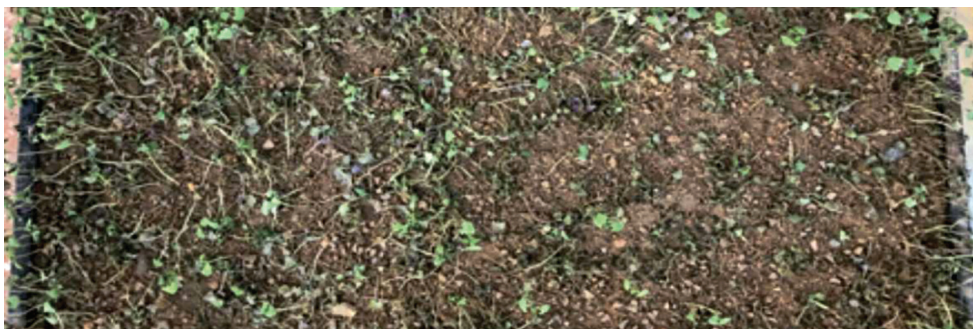
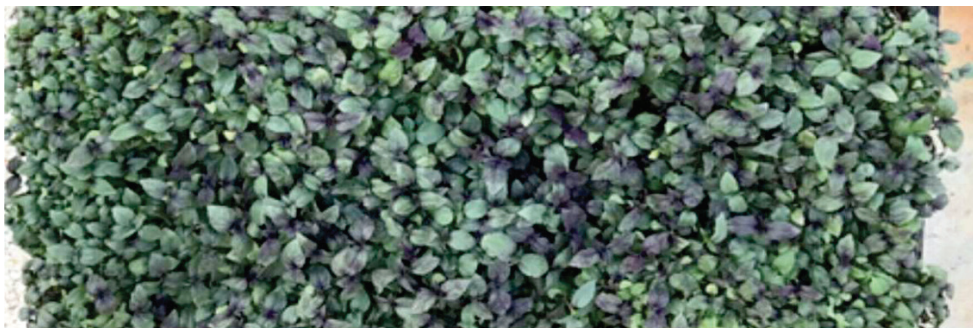




The mint on the left, cultivated under LED light, exhibits a noticeably different growth pattern compared to the one on the right.



lentil sprouts cultivated under LED lights (After two weeks)



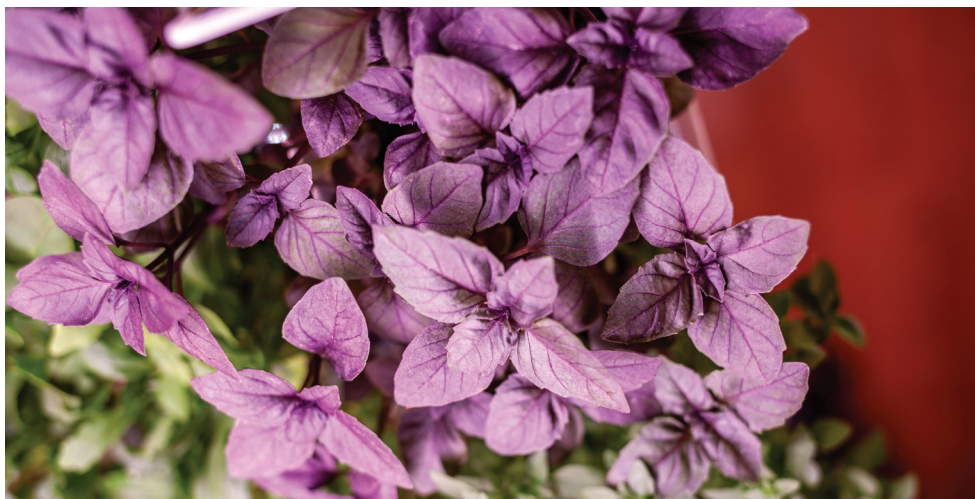
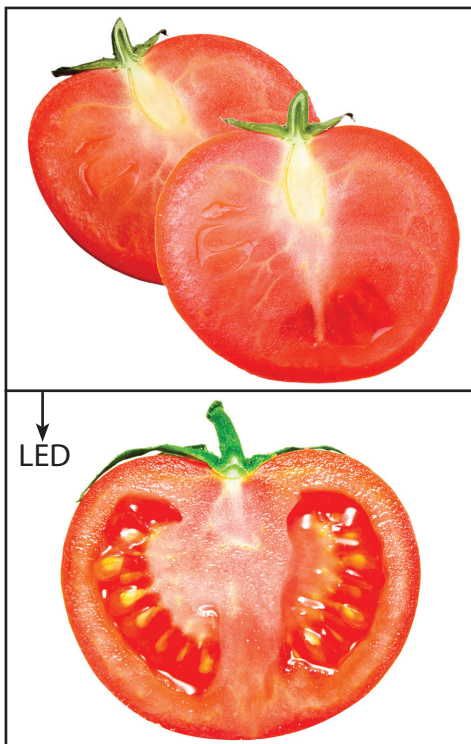
the growth of microgreens cultivated under LED lights (up) to those grown under traditional greenhouse conditions (down). The image showcases a crop of plants grown under LED lights, free from any signs of disease or wilting.



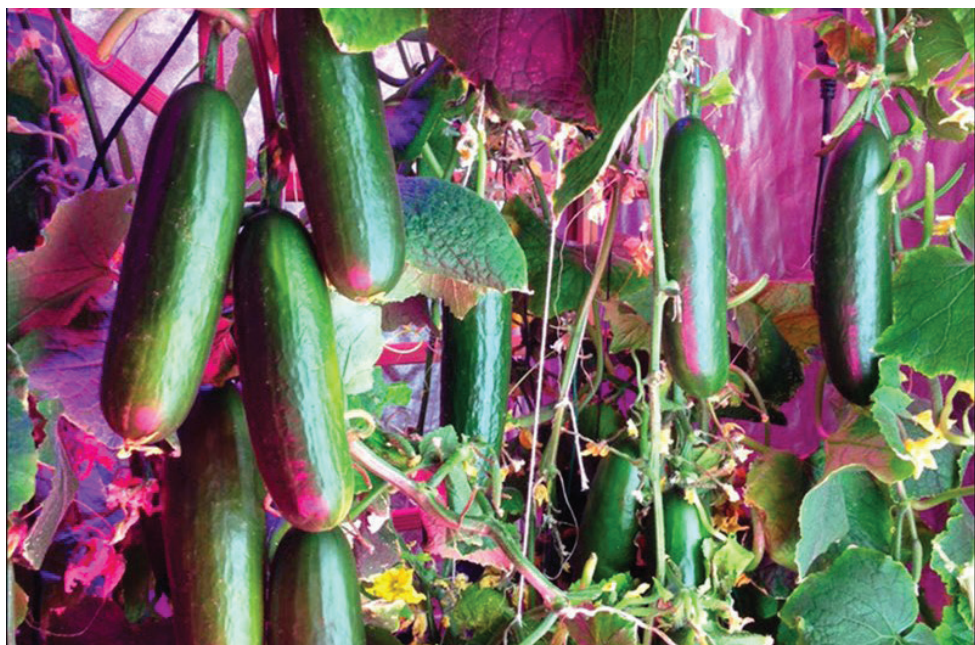
lettuce plants grown under LED lights within one month



The use of LED lights for tomato production has been shown to increase both the quantity and quality of tomatoes.



basil plants cultivated under LED lights within three weeks.



An increase in the number and shelf life of cucumbers has been observed with the use of LED lights.

Flowers and Ornamental Plants



Double flowers with shorter flower clusters possible



Night-Scented Stock: Flowering with LED light (after one month)



Pot Marigolds grown with LED light (right image, flowering after one month). Compared to non-LED greenhouse (left image). Increased flower count, diameter, and lifespan on plant with LED light.

After 6 days



After 2 days



After 20 days



Petunia Growth with LED Light flowering after 20 days

The images demonstrate the impact of LED light on enhancing the growth and flowering of Petunias.



Evidence of the effectiveness of LED lights in cultivating healthy, thriving Petunias in comparison with non-LED conditions.



Producing ornamental plant cuttings in the shortest possible time (less than one month)



Effect of LED light on the size and quality of roses in a greenhouse (left) Compared to a regular flower branch without LED light (right)

Medicinal Plants



Growth of the lemon balm medicinal plant under LED light helps to produce larger and darker leaves with more essential medicinal oils (left) Lemon balm plant under normal greenhouse conditions (right)



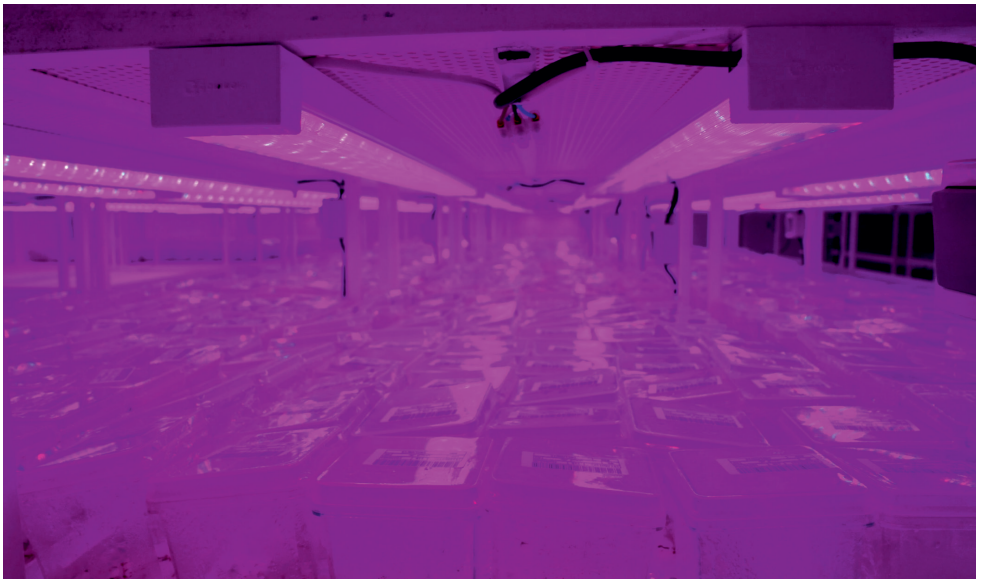
Increased growth and production of phytochemical compounds in oregano plant with the help of red and blue LED light (right) Without LED light (left).



Increased essential oil and active ingredient content in peppermint plant

Plant Tissue Culture

Enhancing Secondary Metabolite Production in Plant Tissue Culture with LED Lights



Animal Science



Increased Milk Production and Quality under LED lights.



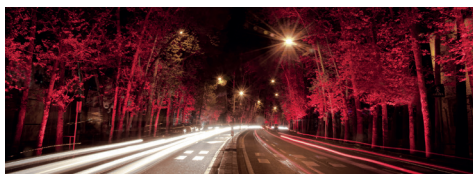
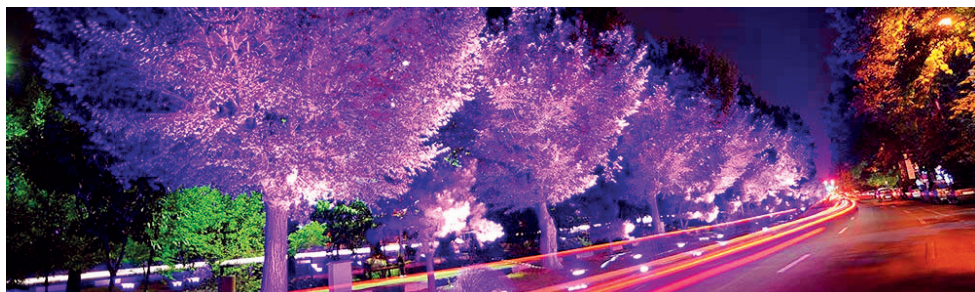
LED lights can promote faster muscle growth in broiler chickens, particularly in the breast and thigh areas



LED lights can accelerate embryo development in chicken eggs, leading to faster hatching and increased chick production

The Impact of Nighttime Illumination on Trees and Ecosystems

Light plays a crucial role in the physiology and ecology of trees and other tree-dependent organisms. The timing, intensity, and spectral composition of light act as key regulators of circadian rhythms, seasonal phenology, and phenotypic diversity, including growth patterns and resource allocation strategies. Consequently, lighting practices in natural and man made urban parks, urban gardens, and roadside lighting significantly impact plants, trees, and their associated biodiversity, including insects, birds, and even human health and well-being. Plants and trees possess plant pigments that function as light receptors, influencing their physiological processes. These light receptors include cryptochromes, phototropins, and phytochromes, each responding to distinct wavelengths of light. Therefore, proper tree lighting requires the use of appropriate lamps that offer control over light intensity, timing, and spectral composition, which enables suitable illumination of various landscape trees and even fruit trees.



Golnoor LED Lights for Tree Illumination

LED Grow Lights



Satin bio

Specifications	Measure
Power (W)	17 W - 32 W
Body Length (cm)	100 - 192
Light Source	SMD LED
Ingress Protection (IP)	IP65
Body Material	Polycarbonate
Dominant Wave Length (nm)	Red: 660 , Blue: 460 , Red: 730
Rated Lifetime (L ₇₀ B ₁₀)	70000 (h)



Tiana bio

Specifications	Measure
Power (W)	30 W - 30 W - 60 W
Body Length (cm)	60 - 100 - 192
Light Source	SMD LED
Ingress Protection (IP)	IP65
Body Material	Extruded Aluminum
Dominant Wave Length (nm)	Red: 630 , Blue: 460
Rated Lifetime (L ₇₀ B ₁₀)	70000 (h)

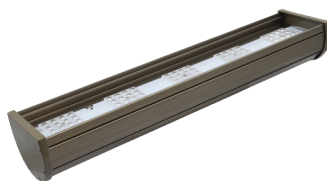


LED Grow Lights



Azarakhsh 2 bio

Specifications	Measure
Power (W)	100 W
Body Length (cm)	100
Light Source	SMD LED
Ingress Protection (IP)	IP65
Body Material	Extruded Aluminum
Dominant Wave Length (nm)	Red: 660 , Blue: 460 , Red: 730
Rated Lifetime ($L_{70B_{10}}$)	70000 (h)





Golnoor

Light up Your Life

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