The latest HEFL lighting unit with newly designed reflector realized less electricity consumption, more lighting energy under the lamp (150ppf)

1. 23% less electricity consumption
2. 30% brightness increased
3. 23% vegetable weight increased

Business example

The anti-aging vegetable Tsuburina (ice plant) is grown using HEFL light at the Nagahama Vegetable Factory of Nihon Advanced Agri Co., Ltd. Packed and head forms of Tsuburina are available. We also sell Tsuburina seeds.

Optical wave length characteristic of HEFL

In vegetable farming, it is said that Blue wavelength influences stem and leaves forming and blooming, and Red wavelength makes photosynthesis better. Also, it was revealed that high vitamin and high poly-phenol contained vegetable can be produced by applying ultraviolet rays and Blue wavelength rays. HEFL has optical wave length required for vegetable farming.

At vegetable artificial farming, high mineral, high vitamin and high poly-phenol but less nitrate nitrogen contained vegetable can be produced by controlling liquid fertilizers mixture and optical wave length.

Experiment of optical wave length affection

Examples of Tsuburina (ice plant) experiments

- The weight per head is high.
- The stalks are not very crisp.
- The leaves grow and become dense.
- The taste is weak.

- The weight per head is low.
- The stalks are tall but firm and hard.
- Many of the leaves are small and light.
- The taste is strong.

As a whole, both the stalks and leaves grow in a balanced manner.
- The taste is good.

As a whole, the stalks are thick and the leaves are large.
- Crispy.
- The taste is good.

Red LED lamp has 660nm peak normally due to the material (GaAlGe), but HEFL has 610nm peak. And 610nm has twice PPF (Photosynthetic Photon Flux Density) than 660nm. It has confirmed that 610nm can produce better vegetable growth than 660nm by our experiment.

Note: Red wave length

HEFL lighting unit

5 advantages

- Thin (Dia. 3.4mm Lamp)
- Nearness lighting More tiers
- Longer life (Over 40K Hrs)
- Low maintenance cost
- Level lighting
- Multi wave length available

Healthy vegetable farming

Comparison of HEFL and traditional fluorescent lamp

Relation between lighting distance vs PPF

Lamp colors

<table>
<thead>
<tr>
<th>Lamp colors</th>
<th>Tube Length</th>
<th>Distance from HEFL unit surface (cm)</th>
<th>PPF</th>
<th>Optical wave length</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>4500~1100mm</td>
<td>1</td>
<td>6000</td>
<td>450nm</td>
</tr>
<tr>
<td>Blue</td>
<td>660nm</td>
<td>2</td>
<td>6000</td>
<td>600nm</td>
</tr>
<tr>
<td>Red</td>
<td>500nm</td>
<td>3</td>
<td>6000</td>
<td>600nm</td>
</tr>
<tr>
<td>Far infrared</td>
<td>740nm</td>
<td>4</td>
<td>5500</td>
<td>740nm</td>
</tr>
<tr>
<td>UV</td>
<td>365nm</td>
<td>5</td>
<td>5500</td>
<td>365nm</td>
</tr>
</tbody>
</table>

Custom color order available

New lighting source [HEFL] realizes ideal agriculture

New Model HEFL® Lighting Unit

Hybrid Electrode Fluorescent Lamp

[HEFL] is a new fluorescent lamp for agricultural application modified back light lamps used for large scale LCD TV set.

Cultivation of Tsuburina in containers

Functional vegetable of Mama's Farm

Tsuburina

Anti-aging vegetable Tsuburina
http://mama-farm.jp/

Nihon Advanced Agri Co., Ltd

www.adv-agri.co.jp
**Compact farming system**

**Compact system and healthy seedling production**
- You can produce quality seedlings with thick stalks and uniformly colored leaves.
- Light strength can be controlled.
- Short-term shipping and stable supply are possible.

**Pre-production system**
For verification before full production system installation.

Harvest 18 heads every 4 days (lettuce)
HEFL unit: 100V 80-90W x 12 units

**HEFL lighting unit line-up**
- 8 lamps
- 12 lamps
- 10 lamps

<table>
<thead>
<tr>
<th>Basic model</th>
<th>Growth chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 lamps</td>
<td>10 lamps</td>
</tr>
<tr>
<td>12 lamps</td>
<td>20 lamps</td>
</tr>
<tr>
<td>14 lamps</td>
<td>450mm x 450mm</td>
</tr>
<tr>
<td>20 lamps</td>
<td>T: 50mm</td>
</tr>
</tbody>
</table>

- **Size**
  - 8 lamps: 700mm x 900mm
  - 12 lamps: 750mm x 900mm
  - 14 lamps: 852mm x 900mm
  - 20 lamps: 852mm x 900mm

- **Lamp spec.**
  - 852mm x 900mm

- **Power consumption**
  - 70~90W
  - 100~115W
  - 120~160W
  - 175~225W

- **Voltage**
  - 100V~240V

- **Option:**
  - Dimmer (Adjustable 30-100%)
  - Light weight: 8 lamps: 7 kg, 12 lamps: 8 kg

**Utilize your space or basement**
With this system, leafy vegetables such as ice plant (Tsuburina) and lettuce (red fringe) can be cultivated and harvested in a planned manner in places such as empty warehouses, vacant buildings, and basement rooms.

(Additional construction of a class 100,000 cultivation room, air conditioning equipment, and a CO2 controller is required.)

**Inquiry**
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