# Performance of salad-type plants grown under narrow-spectrum light-emitting diodes in a controlled environment

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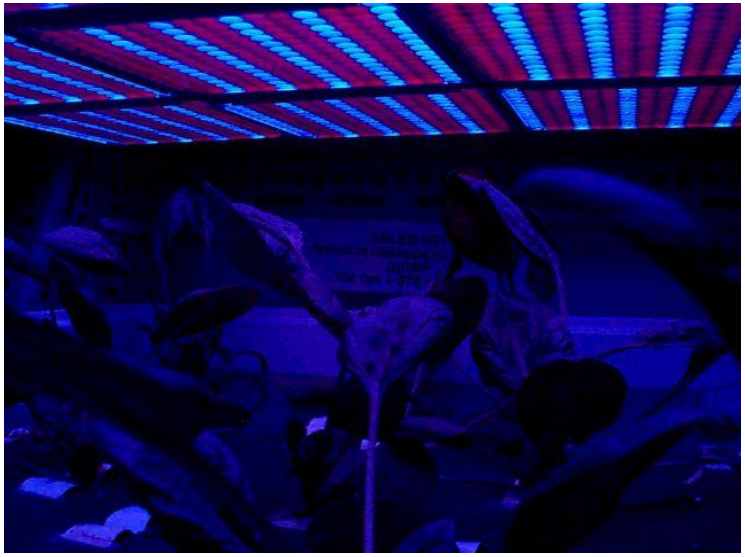
HPS CWF

690 + 470 nm 700 + 470 nm

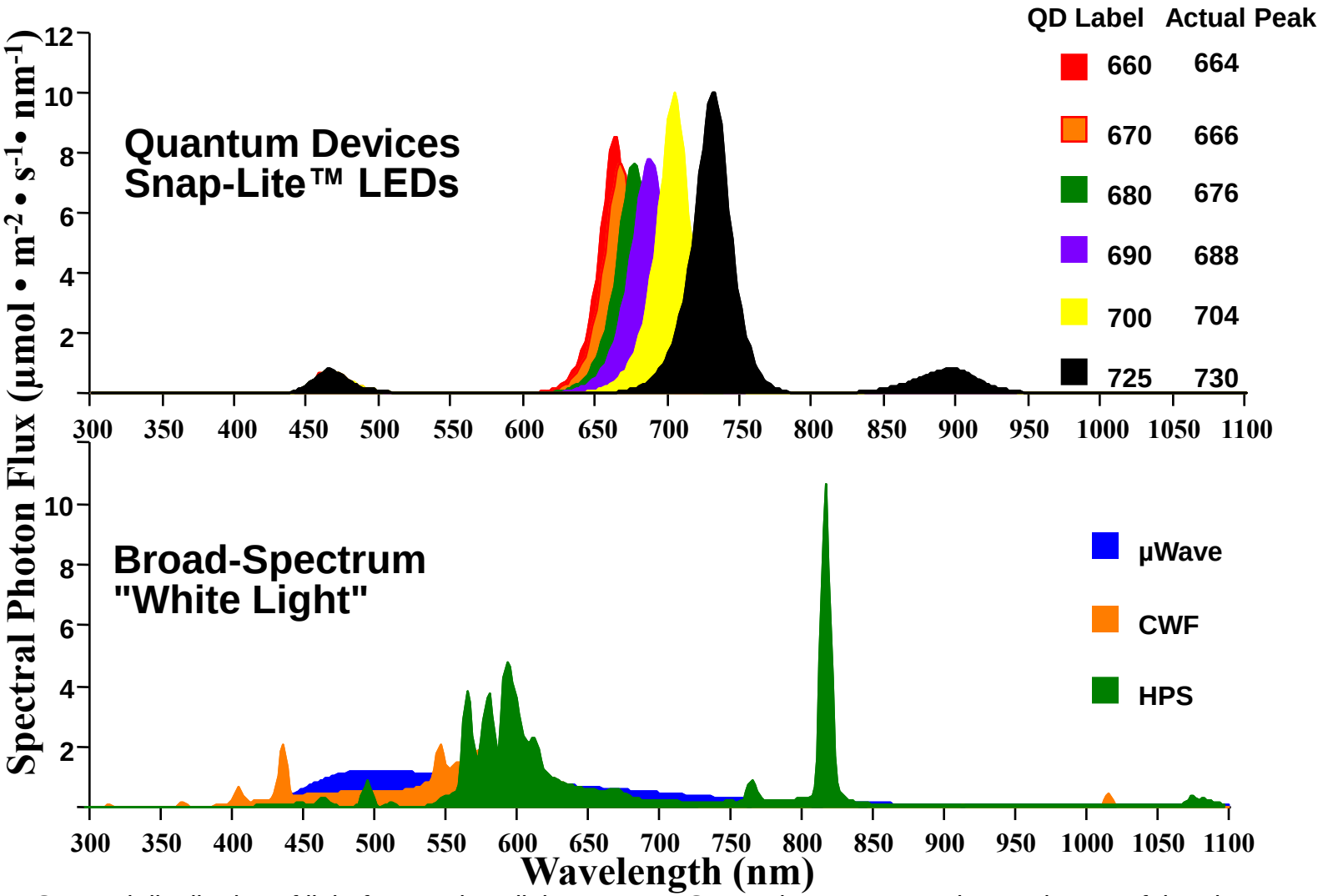


Spinach at 26 dap under different lamp banks

# Spectral Characteristics of Lighting Sources

| | Lamp | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Characteristic** | **µWave** | **CWF** | **HPS** | **660** | **670** | **680** | **690** | **700** | **725** |
| | | | | ($\mu mol \cdot m^{-2} \cdot s^{-1}$) | | | | | |
| **300-400** | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **400-500** | 66 | 54 | 16 | 22 | 22 | 22 | 21 | 23 | 25 |
| **500-600** | 113 | 130 | 129 | 1 | 1 | 1 | 1 | 2 | 2 |
| **600-700** | 72 | 66 | 106 | 227 | 227 | 230 | 228 | 130 | 18 |
| **700-800** | 35 | 7 | 28 | 1 | 3 | 11 | 47 | 188 | 319 |
| **800-900** | 16 | 4 | 100 | 0 | 0 | 0 | 0 | 31 | 0 |
| **900-1000** | 11 | 2 | 9 | 0 | 0 | 0 | 0 | 13 | 18 |
| **1000-1100** | 11 | 5 | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Photon flux (300-1100)** | 324 | 272 | 401 | 251 | 253 | 264 | 296 | 378 | 413 |
| **PPF (400-700)** | 250 | 250 | 250 | 250 | 250 | 253 | 249 | 154 | 45 |
| **YPF** | 209 | 218 | 229 | 225 | 221 | 212 | 196 | 150 | 82 |
| **Blue** | 66 | 54 | 16 | 22 | 22 | 22 | 21 | 23 | 25 |
| **R** | 72 | 66 | 106 | 227 | 227 | 230 | 228 | 130 | 18 |
| **FR** | 28 | 4 | 15 | 1 | 2 | 7 | 30 | 94 | 160 |

# Spectral scans (300-1100nm) of light sources




Spectral distribution of light from various light sources. Spectral scans were taken at the top of the plant canopy with a spectroradiometer. Total PPF was approximately 250 µmol•$m^{-2}$•$s^{-1}$ for all light sources.