Claims

1. A horticultural lighting fixture or light emitting component comprising at least one Light Emitting Diode (LED) having

a) first spectral characteristics including a peak in the wavelength range from 600 to 700 nm and arranged to exhibit a full width of half maximum of at least 50 nm or more;

b) second spectral characteristics with a maximum of 50 nm full width of half maximum and arranged to exhibit a peak wavelength in the range from 440 to 500 nm, and

c) all or part of the emission at a wavelength of 600–800 nm is generated using a whole or partial wavelength up-conversion of the LED chip radiation power with at least one up-conversion material in proximity of the LED, and

d) ~~at least a part or the whole of~~ the emission at wavelengths of 500–600 nm is arranged to be reduced below the intensity in 400-500 nm band and below the intensity in 600-700 nm band.

2. The lighting fixture or light emitting component of claim 1, wherein the LED has a spectral characteristics with a freely adjustable peak in the wavelength range from 500 to 800 nm and arranged to exhibit at least 30 nm full width of half maximum.

3. The lighting fixture or light emitting component of any of claims 1 to 2, comprising a second LED with at least one spectral characteristics with maximum 50 nm full width of half maximum and a peak wavelength in the range of 400 to 500 nm and optionally second and third spectral characteristics arranged to have a freely adjustable peak wavelengths in the range from 450 nm to 800 nm.

4. The lighting fixture or light emitting component of claim 3, wherein there is a plurality of LEDs of the first and second type, the ratio of LEDs of the first type to LEDs of the second type being 1 to 100.

5. The lighting fixture or light emitting component of any of claims 1 to 4, wherein the PPF value of the fixture per Watt is 0.35 or higher.

6. The lighting fixture or light emitting component of any of claims 1 to 5, comprising an emission decay rate difference of the first and the second spectral characteristics amounting to less than 20 % during the first 10,000 hours usage, more preferably during the first 25,000 hours usage.

7. The lighting fixture or light emitting component of any of claims 1 to 6, wherein the spectral emission characteristics; intensity, peak wavelength and full width of half maximum are controlled with selection and concentration of phosphor material.

8. The lighting fixture or light emitting component of any of claims 1 to 7, wherein the spectral emission characteristics; intensity, peak wavelength and full width of half maximum are controlled with type of blue emission characteristics of a LED chip.

9. The lighting fixture or light emitting component of claims 2 to 8, further comprising at least one electronic control system to switch the first and the second LEDs independently on and off or alternatively dim independently by 0–100 % power.

10. Use of the lighting fixture or light emitting component of claim 1 in providing light for at least one plant.

11. A method for enhancing plant growth wherein at least one lighting fixture or light emitting component of claim 1 emits light to at least one plant.