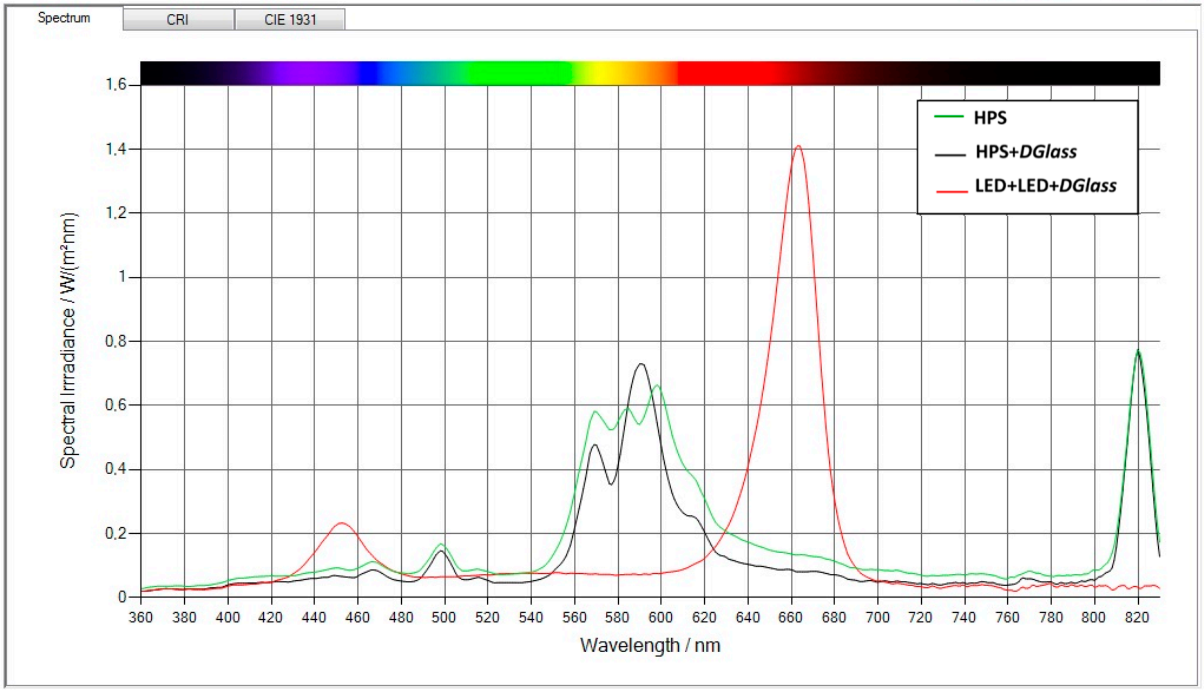


Figure S1. Spectral irradiance depending on the lighting method used on the plants (measured at the height of the tops of the plants in a cultivation chambers on 17.02.2021)

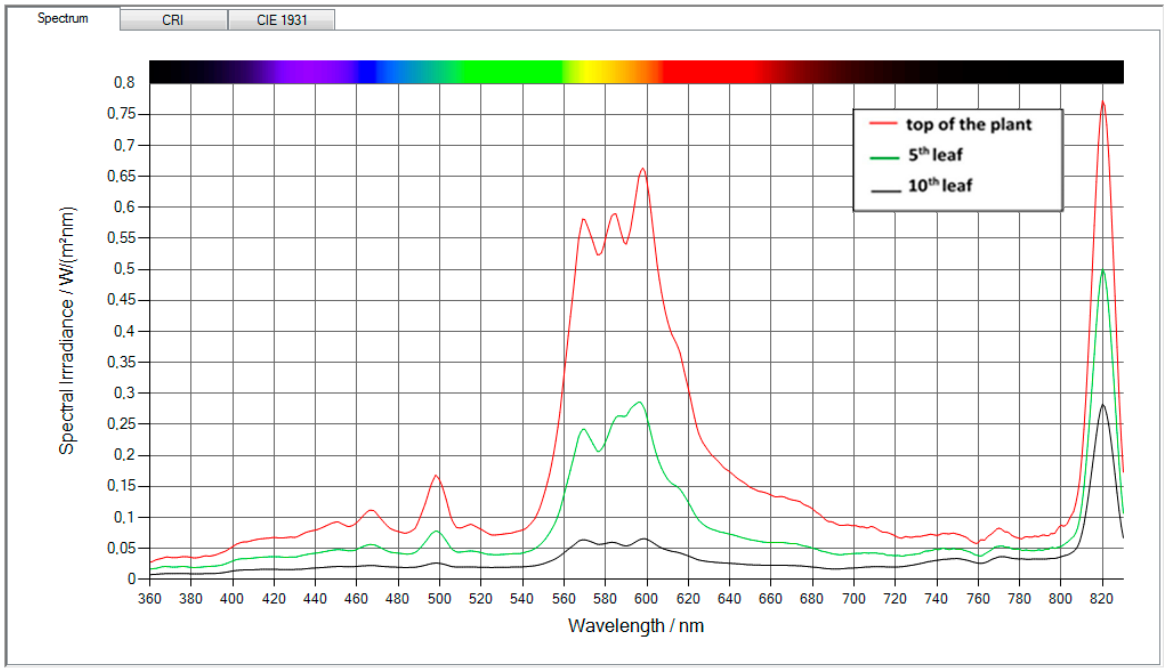


Figure S2. Light characteristics measured at the height of the plant tops and 5th and 10th leaves in a cultivation chamber with HPS lamps (measurement on 17.02.2021)

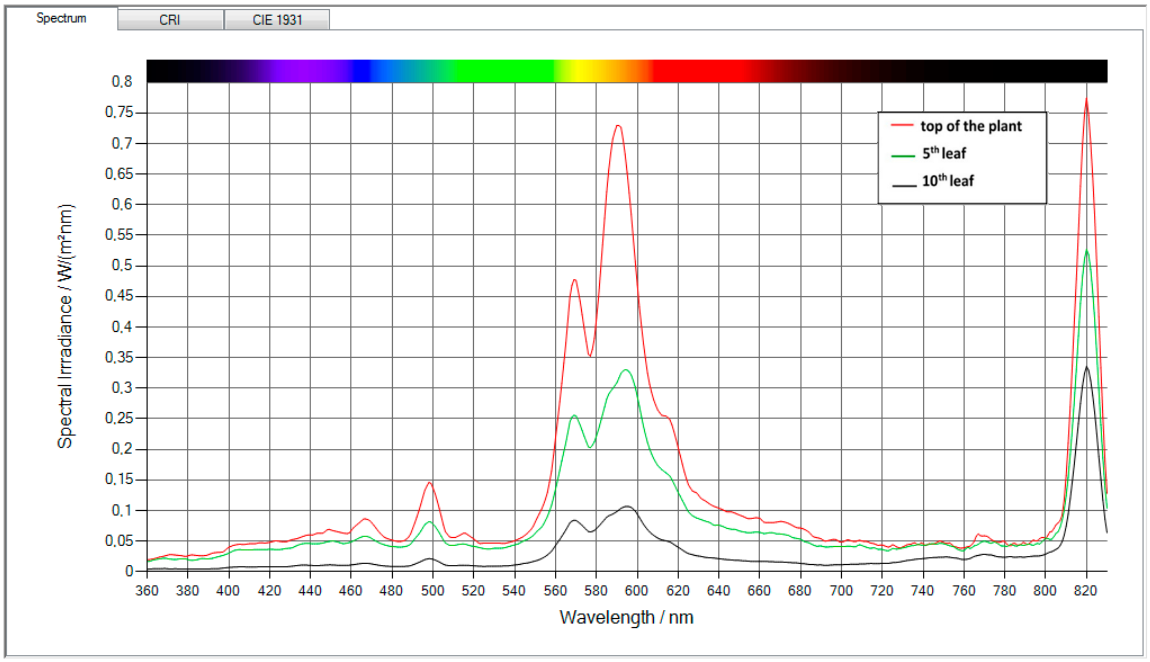


Figure S3. Light characteristics measured at the height of the plant tops and 5th and 10th leaves in a cultivation chamber with HPS lamps and a roof covering of diffusion glass (measurement on 17.02.2021)

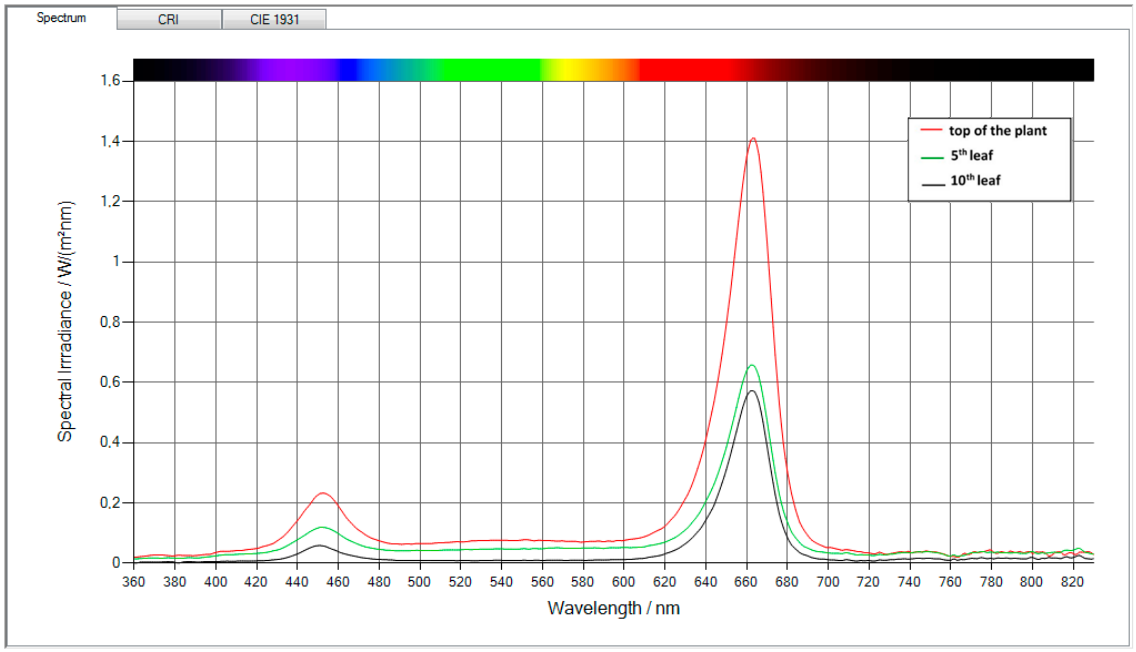


Figure S4. Light characteristics measured at the height of the plant tops and 5th and 10th leaves in a cultivation chamber with LED lamps and a roof covering of diffusion glass (measurement on 17.02.2021)

The levels of solar radiation were measured on the basis of the PAR results from the sensors installed above the lamps in each of the experimental chamber. It was found that with diffusion glass in the chambers, solar radiation PAR levels were on average about 11% higher compared to the control (HPS), a chamber whose roof was covered with conventional greenhouse glass (unpublished results). Figure S1 shows the proportion of photosynthetically active radiation (PAR) measured at the level of the top of the plants grown in the growing chambers differing in the type of glass used to cover the roof and the method of plant illumination used. The diagrams (Figure S2, S3, S4) show the quality of light reaching the plant tips and the fifth and tenth leaves of the tomato, counting from the top of the plant. In the chamber with HPS lamps, the reduction of light with the distance of the leaves from the top of the tomato shoot is shown in Figure S2, in the chamber with HPS lamps and diffusion glass it is shown in Figure S3 and in the chamber with LED+LED+DGlass is presented in Figure S4. The results show changes in the intensity of photosynthetically active radiation at different plant levels, with the PAR intensity measured at the height of the tomato plant tops was taken as 100%. The results from the two measurement dates show that the PAR irradiance intensity in the tomato canopy decreases with distance from the light source. At the height of the 10th leaf, when the top and inter-row plants were supplemented with LED lamps and diffusion glass was used to cover the greenhouse roof, the light intensity was more than 72 % of the PAR irradiance that reached the 5th leaf. In contrast, in the chambers supplemented with HPS lamps and in the HPS+DGlass combination, the 10th leaf counting from the top of the plant had at its disposal about 40% or less of the PAR light intensity that reaches the 5th leaf on the tomato plant (Figure S2 and S3).

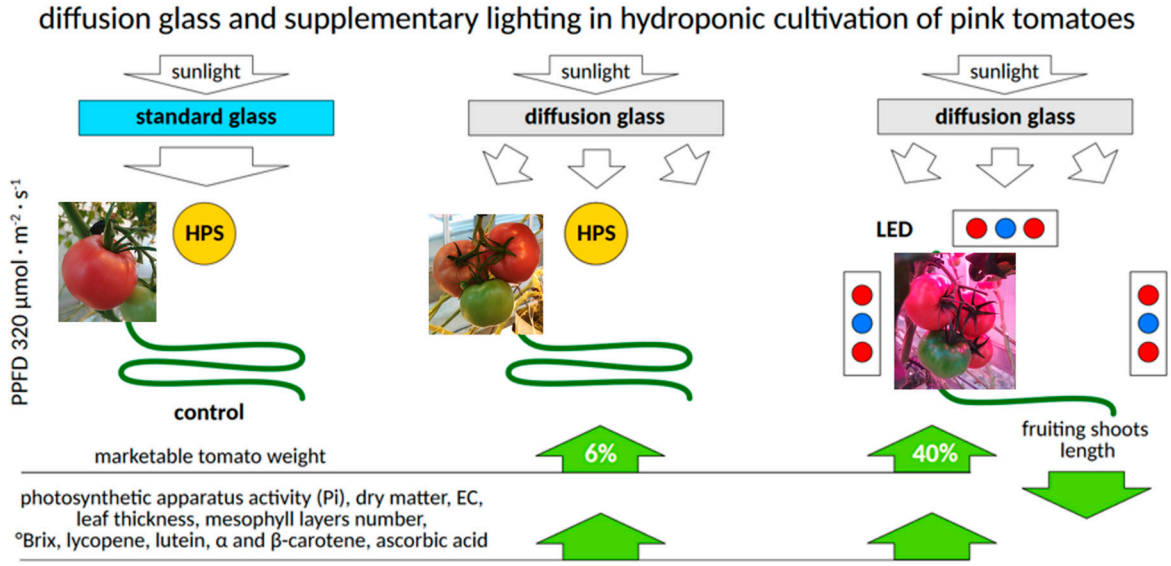


Figure S5. The scheme summarizing the conditions and the results from the experiment