**Additional file 1: Table S1.** Photosynthetic photon flux densities (PPFDs) and mean PPFD of the 30 produced lights (Figure 2) obtained with the original LED-artificial sunlight source system (LASS system, original), and those of the 30 produced lights obtained with the modified LASS system (modified).

| **PCW-LED No.** | **Target PPFD: 150 μmol m−2 s−1** | **Target PPFD: 300 μmol m−2 s−1** |
| --- | --- | --- |
| **Original** | **Modified** | **Original** | **Modified** |
|  1 | 150 | 150 | 263 | 292 |
|  2 | 151 | 151 | 233 | 301 |
|  3 | 147 | 151 | 233 | 301 |
|  4 | 149 | 150 | 251 | 301 |
|  5 | 151 | 152 | 239 | 301 |
|  6 | 152 | 152 | 236 | 301 |
|  7 | 150 | 150 | 246 | 302 |
|  8 | 151 | 151 | 256 | 301 |
|  9 | 149 | 150 | 262 | 300 |
| 10 | 151 | 151 | 261 | 301 |
| 11 | 150 | 150 | 251 | 301 |
| 12 | 149 | 150 | 259 | 302 |
| 13 | 151 | 151 | 262 | 300 |
| 14 | 148 | 150 | 240 | 301 |
| 15 | 148 | 151 | 238 | 301 |
| 16 | 150 | 150 | 254 | 300 |
| 17 | 149 | 150 | 251 | 300 |
| 18 | 149 | 150 | 252 | 300 |
| 19 | 149 | 150 | 262 | 302 |
| 20 | 149 | 150 | 266 | 303 |
| 21 | 149 | 150 | 255 | 304 |
| 22 | 150 | 150 | 274 | 301 |
| 23 | 149 | 150 | 270 | 301 |
| 24 | 151 | 151 | 284 | 300 |
| 25 | 151 | 151 | 283 | 303 |
| 26 | 151 | 151 | 294 | 302 |
| 27 | 151 | 150 | 290 | 304 |
| 28 | 151 | 151 | 275 | 303 |
| 29 | 151 | 151 | 262 | 299 |
| 30 | 150 | 150 | 284 | 303 |
| Mean | 150 | 150 | 260 | 301 |