**Note: keep the bound of can be negative, 0, and positive (-100,100) (-50,50).**

**Nitrate inflow rate is 0.003 L/hr, from the 60th hour to the 144th hour.**

**Light intensity: 150 umol/m2/s**

|  |  |  |  |
| --- | --- | --- | --- |
| Time (h) | DCW (g/l) | nitrate | lutein content |
| hours | g/L | mM | mg/l |
| 0 | 0.077 | 9.0324706 | 0 |
| 12 | 0.1917 | 7.2817647 | 0.21 |
| 24 | 0.4266 | 7.0490588 | 0.53 |
| 36 | 0.6534 | 6.3774118 | 0.87 |
| 48 | 0.8896 | 5.0537647 | 1.18 |
| 60 | 1.0955 | 3.7963529 | 1.43 |
| 72 | 1.2457 | 22.209882 | 1.71 |
| 84 | 1.4124 | 46.687176 | 2.02 |
| 96 | 1.5199 | 62.037765 | 2.26 |
| 108 | 1.6932 | 87.137765 | 2.51 |
| 120 | 1.7927 | 105.83541 | 2.72 |
| 132 | 1.9636 | 120.32529 | 2.93 |
| 144 | 2.0446 | 149.50706 | 3.08 |
|  |  |  |  |
| **Light intensity: 300 umol/m2/s** | | | |
| Time (h) | DCW  nitrate | | lutein content |
| hours | g/L | mM | mg/l |
| 0 | 0.0767 | 8.9914118 | 0 |
| 12 | 0.2152 | 5.7255294 | 0.33 |
| 24 | 0.4744 | 5.5945882 | 0.74 |
| 36 | 0.7273 | 3.6561176 | 1.11 |
| 48 | 0.9908 | 2.9329412 | 1.42 |
| 60 | 1.1808 | 1.7270588 | 1.77 |
| 72 | 1.3592 | 20.227529 | 2.12 |
| 84 | 1.5168 | 43.894588 | 2.52 |
| 96 | 1.7003 | 60.153529 | 2.77 |
| 108 | 1.8854 | 84.229176 | 2.92 |
| 120 | 2.0366 | 100.71647 | 3.16 |
| 132 | 2.1583 | 114.07212 | 3.32 |
| 144 | 2.2641 | 140.99576 | 3.47 |

**Light intensity: 480 umol/m2/s**

|  |  |  |  |
| --- | --- | --- | --- |
| Time | DCW | nitrate | lutein content |
| hours | g/L | mM | mg/l |
| 0 | 0.077 | 31.169294 | 0 |
| 12 | 0.3811 | 31.740588 | 0.77 |
| 24 | 0.6876 | 28.450824 | 1.35 |
| 36 | 0.9821 | 27.440588 | 1.93 |
| 48 | 1.2837 | 30.598118 | 2.35 |
| 60 | 1.4993 | 27.646824 | 2.83 |
| 72 | 1.6791 | 40.660353 | 3.11 |
| 84 | 1.9052 | 75.170706 | 3.45 |
| 96 | 2.1708 | 98.030706 | 3.68 |
| 108 | 2.3233 | 124.34353 | 3.98 |
| 120 | 2.4825 | 140.41035 | 4.18 |
| 132 | 2.6442 | 157.87682 | 4.42 |
| 144 | 2.7401 | 177.43624 | 4.62 |
|  |  |  |  |
| **Light intensity: 600 umol/m2/s** | | | |
| Time | DCW | nitrate | lutein content |
| hours | g/L | mM | mg/l |
| 0 | 0.077 | 31.772235 | 0 |
| 12 | 0.291 | 35.3 | 0.61 |
| 24 | 0.572 | 30.719765 | 1.11 |
| 36 | 0.8496 | 29.397529 | 1.61 |
| 48 | 1.0979 | 34.030588 | 2.03 |
| 60 | 1.3347 | 30.270235 | 2.45 |
| 72 | 1.5264 | 49.003647 | 2.78 |
| 84 | 1.7396 | 83.223294 | 3.11 |
| 96 | 1.892 | 103.87659 | 3.46 |
| 108 | 2.0587 | 131.126 | 3.63 |
| 120 | 2.1971 | 149.36165 | 3.93 |
| 132 | 2.3153 | 166.04824 | 4.15 |
| 144 | 2.4464 | 185.88188 | 4.26 |
|  |  |  |  |