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**Figure S1.** Changes in the gas exchange parameters; net photosynthetic rate (Pn) (**a**), stomatal conductance (gs) (**b**), intercellular CO2 concentration (Ci) (**c**), transpiration rate (E) (**d**), and water use efficiency (WUE) (**e**) of kale before treating with different levels of UV-A. Means with the same letter are not significantly different according to Tukey's HSD test at *p* < 0.05. Data are means ± SD shown by vertical error bars.

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**Figure S2.** Changes in the quantum efficiency parameters; maximum quantum yield of PSII (Fv /Fm) (**a**), quantum efficiency of photosystem II (Y(II)) (**b**), photochemical quenching (qP) (**c**), non-photochemical quenching (NPQ) (**d**), and electron transport rate (**e**) of kale before treating with different levels of UV-A. Means with the same letter are not significantly different according to Tukey's HSD test at *p* < 0.05. Data are means ± SD shown by vertical error bars.

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**Figure S3.** Changes in spectral indices; normalized difference vegetation index (NDVI) (**a**), simple ratio index (SR)) (**b**), normalized phaeophytinization index (NPQI) (**c**), photochemical reflectance index (PRI) (**d**), structure insensitive pigment index (SIPI) (**e**), normalized difference red edge index (NDRE) (**f**), and water index (WI) (**g**) of kale before treating with different levels of UV-A. Means with the same letter are not significantly different according to Tukey's HSD test at *p* < 0.05. Data are means ± SD shown by vertical error bars.

**Table S1.** Agronomic traits of kale at 14 days before treating with different levels of UV-A

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| UV-A (w/m2) | Fresh weight (g) | Stem height (cm) | Canopy width (cm) | Stem diameter (mm) | Number of leaves  | Leaf greenness index (SPAD unit) |
| 0 | 40.22 ± 7.41 | 26.17 ± 2.48 b | 30.10 ± 2.60 | 7.68 ± 1.08 | 9.83 ± 0.41 | 47.45 ± 1.87 |
| 5 | 46.79 ± 6.13 | 31.20 ± 2.04 a | 33.70 ± 3.19 | 9.12 ± 1.43 | 9.67 ± 1.21 | 44.55 ± 2.11 |
| 10 | 40.84 ± 7.17 | 28.33 ± 3.14 ab | 30.42 ± 2.44 | 7.66 ± 1.37 | 8.33 ± 0.52 | 46.65 ± 5.13 |
| 15 | 45.32 ± 5.98 | 31.33 ± 2.07 a | 32.79 ± 3.99 | 9.46 ± 1.34 | 9.40 ± 1.20 | 45.67 ± 2.85 |
| Sig. | ns | \*\* | ns | ns | ns | ns |

Data are means ± SD. Means with same lowercase letter are not significantly different according to Tukey’s HSD test. ns and \*\* indicate not significantly different at *p* < 0.05 and significantly different at *p* < 0.01, respectively.