The spectral irradiance, growth, photosynthetic characteristics, antioxidant system, and nutritional status of green onion (*Allium fistulosum* L.) grown under different photo-selective nets

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Text S1

Soluble sugar. A 0.5 g sample of green onion leaf and pseudo-stem homogenate was accurately weighed, 10 ml of distilled water was added to the homogenate, and centrifuge at 10,000 × g for 10 min using a centrifuge. Then, the soluble sugar content was determined as described by Wan et al. (2014).

Cellulose. The cellulose content was determined by concentrated sulfuric acid hydrolysis and sugar determination (Viles and Silverman, 1949) with slight modifications. Samples of 0.5 g of green onion leaf and pseudo-stem were accurately weighed and then digested with 60 ml of 60% sulfuric acid solution in a cold-water bath for 30 min. The mixture was brought to 100 ml with 60% sulfuric acid solution, shaken well, and filtered with a Buchner funnel. Then, 5 ml of the filtrate was placed in a 100 ml volumetric flask, shaken, brought to 100 ml with distilled water, and filtered. The filtrate was used as the cellulose extract to determine the cellulose content.

Soluble protein. The soluble protein content was measured according to Paciolla et al. (2010) with slight modifications. One gram of frozen green onion was ground in 4 ml of a solution containing the following ingredients: 0.05 M Tris-HCl (pH 8.0), 0.001 M EDTA, 0.01 M $MgCl_2$ and 0.05% cysteine. The homogenate was centrifuged at 20,000 × g for 20 min at 4 °C, and the resulting supernatant was tested for soluble protein content according to Bradford (1976) with serum albumin as the standard.

Free amino acid. The free amino acid content was measured by the ninhydrin solution chromogenic method (Huang et al., 2010). Green onion leaves and pseudo-stem powder (0.4 g) were weighed out separately, placed in a 250 mL round-bottom flask, and boiled with water 3 times. Added 40 ml of water, boil for 1 h, added 20 mL of water, boil for 0.5 h, added 20 mL of water, boil for 0.5 h, and filtered while hot after each boiling. The three filtrates were combined and placed in a 100 mL volumetric flask, diluted with water to 100 mL, and used as the test solution. Three milliliters of the test solution was placed in a 25 mL volumetric flask, 1.0 mL of sodium acetate buffered saline solution at pH 5.0 and 2.0 mL of 2.0% ninhydrin solution were added, and the solution was boiled in a 100 °C

water bath for 19 min and then cooled for 10 min. The absorbance of the color system was measured at 568 nm. The free amino acid content was calculated according to the standard curve of Huang et al (2010).

Vitamin C. Vitamin C content was assessed spectrophotometrically (Samuoliene et al., 2012). Plant tissue (1.0 g) was accurately weighed out, and 10 ml of 5% oxalic acid was added to grind it into a homogenate. Then centrifuged at 2000 × g for 5 min at 4 °C. Add 2 ml of 0.1% methyl viologen and 2 ml of 2 M sodium hydroxide to 1 ml of supernatant, shake well, and let stand for 2 min. The OD was read at 600 nm with a spectrophotometer.

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