Analysis of High-temperature Injury in Panax ginseng as Affected by Shading

Inbae Jang1,2, Jiwon Moon1, Jin Yu1, Inbok Jang1, Sujeoung Suh1, Hyunseung Hwang2 and Changhoo Chun2,3*

1Department of Herbal Crop Research, NIHHS, RDA, Eumseong 27709, Korea, 2Department of Plant Science, Seoul National University, Seoul 08826, Korea, 3Research Institute for Agriculture and Life Sciences, Seoul National University, Seoul 08826, Korea

High temperature damage in ginseng is influenced by shading materials related not only to temperature, but also to light intensity and quality. Though green-colored khaki shading sheet (GCSS) is recently developed and widely used, there is limited research information about their attributes and use. The four-layered shading net (FLSN) as control, blue-colored shading sheet (BCSS), aluminum-coated shading board (ACSB), and GCSS were installed in the wooden A type of sun-block facilities. Two layered black, shading net was additionally used to cover the facilities for decreasing temperature since the beginning of June. The average temperature and inside light transmission rates after 9 A.M. at the facility where different shades were obtained was in the order of BCSS (28.9°C) > FLSN (27.7°C) > GCSS (27.6°C) > ACSB (27.1°C) and GCSS (6.7%) > FLSN (6.4%) > BCSS (4.6%) > ACSB (4.5%), respectively. Spectral properties measured under shading materials at 1,000‒1,100 µmol·m⁻²·s⁻¹ (outside quantum) were varied. Spectrum of BCSS was similar to GCSS but, ACSB was different by increasing from 687 nm. High temperature injury rates were in order: FLSN > ACSB > GCSS > BCSS but, root weight varied and was in the order: ACSB > GCSS > BCSS > FLSN. High temperature damage is possible not only because of temperature increase, but also due to various light environmental factors. Ginseng high temperature injury was minimal when BCSS or GCSS were covered. Based on the above results, light spectrum may also affected high-temperature injury of ginseng. Although the root weight was higher in ACSB, it could be vulnerable to reflected light damage or excessive influx of above 687 nm.

T. 02-880-4567, changhoo@snu.ac.kr