

대학원생 연구 발표-03

Correlation between Stomatal Characteristics and Agronomic Traits Among Korean Wheat CultivarsSeong-Wook Kang¹, Ji-Yoon Han¹, JaeBuhm Chun², Chang Hyun Choi³, Chon-Sik Kang³, Seong-Woo Cho^{1*}¹Department of Smart Agro-Industry, Gyeongsang National University, Jinju 52725, Korea²The division of digital agriculture, Rural Development Administration, Wanju 55365, Korean³National Institute of Crop Science, Rural Development Administration, Wanju 55365, Korean**[Introduction]**

Tolerance against abiotic stresses is important to respond climate change. Drought stress of abiotic stresses is seriously related to plant growth based on photosynthesis through stomata. Therefore, correlation between stomatal traits and drought tolerance is studying in crop cultivation. Hence, drought affect to wheat growth in early growth and maturation stages. In this study, stomatal traits of Korean wheat cultivars were evaluated to identify correlation with agronomic traits.

[Materials and Methods]

Stomatal traits were evaluated with flag leaves of 35 Korean wheat cultivars. Flag leaf width (FLW), stomatal traits as stomatal density (SD), aperture length (APL) and width (APW), and guard cell length (GCL) and width (GCW) were observed by using phase-contrast microscope. After focusing, three pictures of each adaxial and abaxial surface of cultivars were taken at 100 times magnification for count number of stomata. Microscopes were refocused, ten pictures of stomata of each side of leaves were taken at 400 times magnification for analysis stomatal traits.

[Results and Discussion]

Among 35 Korean wheat cultivars, 22 cultivars showed significantly different SD between adaxial and abaxial side of a flag leaf. 18 cultivars showed significantly different APL, and 15 cultivars showed significantly different APW. 14 cultivars showed significantly different GLC, and 10 cultivars showed significantly different GCW. In adaxial side, FLW showed negative correlation with culm length ($r=-0.349^*$) and positive correlation with grain number per panicle ($r=0.480^{**}$). SD showed negative correlation with GCL ($r=-0.340^*$), and APL showed positive correlation with GLC ($r=0.916^{***}$). Spike length (SL) showed positive correlation with grain number per panicle (GNP, $r=0.372^*$), and tiller number showed negative correlation with thousand grain weight (TGW, $r=-0.457^{**}$). In abaxial side, GCL showed positive correlation with APL ($r=0.714^{***}$) and negative correlation APW ($r=-0.484^{**}$). SL showed positive correlation with GNP ($r=0.372^*$), and TN showed negative correlation with TGW ($r=-0.457^{***}$). The Principal component analysis was loaded to verify multivariate correlations between stomatal traits and agronomic traits. PCs explained 40.1% in adaxial side and 39.3% in abaxial side. In adaxial side, the PC1 explained negative relationship between FLW and GCW, positive relationship with CL. In abaxial side, the PC1 explained positive relation between TGW and GCW.

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