Evaluation of Agronomical Traits, Grain Properties and Fertilization Effect on Korean Wheat Quality Improvement

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We evaluated the agronomic characteristics and grain properties of Korean wheat to improve grain quality of Korean wheat and enhancing the consumption of Korean wheat of 175 farmers in nationwide for two years, 2010/2011 and 2011/2012. Agronomic characteristics including culm length, spike length, number of spike/m\textsuperscript{2}, rate of off-type plant and grain properties including 1000 kernel weight, test weight, moisture, ash and protein content were influenced by year and location. Number of spike/m\textsuperscript{2}, test weight, moisture, ash and protein content of wheat cultivated in 2011 were higher than those of 2012 and culm length, spike length, rate of off-type plant and 1000 kernel weight of 2012 were higher than those of 2011. Wheat cultivated in southern part of Korea showed higher culm length and 1000 kernel weight and showed lower in respect of test weight than those of northern part of Korea. Spike length, number of spike/m\textsuperscript{2} and test weight were reduced by additional fertilization after mid of March. Although, there was no significant difference between time of additional fertilization and grain properties. Cultivated wheat in Jeollabuk-do showed lower ash content and higher protein content than those of other provinces and cultivated wheat in Jeollanam-do exhibited higher ash content than that of other provinces. As amount of fertilization increased, culm length, 1000 kernel weight and protein content increased and spike length and ash content were decreased, although time of additional fertilization did not effect on agronomic characteristics and grain properties. Amount of fertilization was positively correlated with 1000 kernel weight and protein content ($r = 0.159, P < 0.05$ and $r = 0.212, P < 0.01$, respectively) and was negatively correlated with ash content ($r = -0.185, P < 0.05$). Thousand kernel weight was negatively correlated with ash content ($r = -0.226, P < 0.01$) and positively correlated with protein content ($r = 0.207, P < 0.01$). Ash content was increased as test weight and culm length decreased and 1000 kernel weight was influenced by culm and spike length ($r = 0.397, P < 0.001$ and $r = -0.205, P < 0.01$, respectively).

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Fig. 1. The relationships between amount of basal fertilizer and culm length (A), spike length (B), 1000 kernel weight (C), ash content (D) and protein content (E). $r =$ correlation coefficients ($n = 171$). *, ** and *** means $P = 0.05$, $P = 0.01$ and $P = 0.001$, respectively.