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ORIGINAL SCIENTIFIC PAPER

Phenotypic variability of primary spike length in winter wheat (*Triticum aestivum* L.)

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Abstract
Spike length (cm) was studied in 10 wheat genotypes which were grown during two years on the experimental field in three replicates. Samples of 60 wheat plants (20 plants per replicate at each year) were analyzed in full maturity. Genotype G-3552 had highest average value of spike length (11.46 cm), while genotype G-3419 had lowest average spike length (8.58cm). All tested cultivars had higher average value of spike length in the second year (10.89 cm) in compare to the first year (9.53 cm) of examination. Average CV (%) for all examined cultivars in both years was CV=8.21%, that indicated expressed variability. The phenotypic components of variance of spike length indicated high effect of genetic factors (49.48%), and environmental factors (40.41 %) had high influence on expression of spike length, too.

Key words: wheat, cultivar, spike length, variability

Introduction

The permanent task of wheat breeders is improvement of yield, quality and resistance to stress environmental factor, through breeding programs. This is very hard to achieve because of complex nature of yield and quality and negative correlation between those two complex traits. Successful wheat breeding must be based on the knowledge of genetic control of characteristics of genotypes and behavior of genotypes in environmental conditions. The wheat grain yield depends on numerous yield components and environmental factors (Kraljevic-Balalic et al., 2001). The parameters as plant height, spike length, number of spikelets per spike are in positive correlation with grain yield (Zečević and Knežević, 1998). Breeders strive to achieve the most effective method in creating varieties with high yield. They are making a large number of crosses to achieve recombination of genes for desirable genes (Knezevic et al., 2012). Expression of yield potential depends on genotype by environment interaction. For breeders is very important to estimate genotype by environment interaction through phenotypic variability (Kondić et al., 2012). The genetic yield potential of a wheat cultivar may depend on favorable conditions and good agronomy (Drezner et al., 2006; Paunovic et al., 2008). The ideal cultivar for high grain yields, or for any other desirable trait, need to express genetic potential with low value of variance in different environmental conditions (Dimitrijević et al., 2011). For efficient breeding is very important to understand environmental and genotypic causes of significant genotype by environment interaction in all stages of plant breeding (Dhungana et al., 2007) and to develop optimal measure of growth as well as water, fertilizer and pesticide application (Jolánkai et al., 2006; Tanasković et al. 2012). Also, it is important to estimate how efficiently a genotype can withstand the limiting environmental factors as well how efficiently genotype can utilize the favorable environmental factors (Kovačević, 2007).