

# CORRELATION ANALYSIS OF YIELD COMPONENTS IN WINTER WHEAT GROWN UNDER LESS PRODUCTIVE SOIL

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## INTRODUCTION

Considering the importance of wheat production, it is necessary to better utilize the less productive soils and to select wheat varieties that can be successfully grown on such soils. Since that the grain yield of wheat is complex and variable trait that depends on numerous yield components and environmental factors, individual characteristics of the plant, such as the number of grains per spike, grain weight per spike, plant height and harvest index, are important in the formation of grain yield, especially in the stressful conditions of wheat cultivation. The investigation of variability and assessment the interrelationship of yield components could improve cultivar creation, selection and ability of a wheat cultivar to produce high and stable yield over a wide range of environments. The objective of this study was to estimate the variability and relationship between different wheat yield components (the number of grains per spike, grain weight per spike, plant height and harvest index) of eleven winter wheat cultivars growing under stressful conditions of halomorphic soil, solonetz type.

## MATERIALS AND METHODS

In order to evaluate the variability and relationship between different wheat yield components, the field trial was carried out at solonetz soil type and consisted of control - solonetz without amelioration and soil treatments with two levels of soil amelioration using phosphor gypsum, in amounts of 25 and 50  $\text{t ha}^{-1}$ . The trial was set up according randomized complete block design with three replication and was carried out during two vegetation seasons. The experimental material in the study was comprised of eleven winter wheat varieties (*Triticum aestivum* L.), chosen on the basis of their differences in yield and performance of several morpho-physiological traits. The relationship between grain yield components was determined by calculating the Pearson's correlation coefficient ( $r$ ) measuring strength of association between traits. All statistical analyses were carried out using software STATISTICA, version 13 (StatSoft Inc., USA).

## RESULTS AND DISCUSSION

Unfavorable environmental conditions in this study, type of soil and weather conditions, during wheat development decreased the mean values of the investigated components of wheat yield. Correlations differ for different varieties. Statistically significant and strong positive correlation was established between the grain weight per spike and the number of grains per spike in both seasons within each treatment. This results indicated that the number of grains per spike is a trait in which through positive selection, can increase the grain weight per spike. Grain weight per spike and grain weight per plant showed also statistically significant and strong positive correlation with plant height. This results indicate that grain weight per spike, grain weight per plant and plant height can be used as a selection criteria to increase grain weight per spike, per plant, as well, as final grain yield of wheat.

## CONCLUSION

A different reaction of wheat cultivars to soil repair levels was observed, in relation to each treatment and vegetation season. Correlations differed for different varieties also. The lowest variability of the yield components of certain cultivars indicates good adaptation of these cultivars to the stress abiotic conditions on holomorphc soil. However, the calculation of the values of correlation coefficients in different environment facilitates breeding work, since they show the degree of interdependence between yield traits. Significant or highly significant correlation obtained between the examined yield components within all examined treatments indicated the possibility that by improving one component, consequently could improve the final yield on less productive soil.