

# PHENOTYPIC INVESTIGATION OF WHEAT VARIETIES FROM THE „MIHAI CRISTEA” VEGETAL GENETIC RESOURCES BANK, SUCEAVA COLLECTION IN IULS-EZĂRENI RESEARCH FARM CONDITION

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## Introduction

Bread wheat (*Triticum aestivum* L.) is the most widespread self-pollinating crop worldwide, belonging to the *Gramineae* (*Poaceae*) botanical family. Correlation coefficients highlight the degree of association between different traits, thus helping the selection process for obtaining new high-yield wheat varieties.

This study aimed to characterize 20 wheat genotypes from the germplasm collection of the Vegetal Genetic Resources Bank “Mihai Cristea” Suceava (SVGB). Wheat cultivars were analyzed for different morphological and yield traits between 2021 and 2023 at the IULS Ezareni Research Farm. Genotypic and phenotypic variability for different traits was highlighted, and the relationships between different types of traits were estimated using Pearson correlations. The traits analyzed include plant height, spike density, glume color, awns, presence of hairs on glumes, and grain yield. The results show that the wheat germplasm from SVGB has high variability and high agronomic value, and the genotypes studied can be introduced as initial material in wheat breeding programs.

## Materials and method

In this study, 20 wheat genotypes were analyzed from a total of 2600 accessions preserved in the Vegetal Genetic Resources Bank “Mihai Cristea” Suceava. Phenotypic characterization was performed based on morphological descriptors (Table 1) provided by International Board for Plant Genetic Resources (IBPGR – Descriptors for wheat).

Table 1 - IPGRI descriptors used for the morphological description of wheat cultivars

| The descriptor                      | The significance  |
|-------------------------------------|---|
| Plant height (cm)                   | Measure the height of the plant, at maturity, from the ground level to the tip of the spike, excluding the awns, for 10 plants/sample |
| Spike density (FAO notes)           | 1 – Very lax; 3 – Lax; 5. Intermediary; 7 – Dense; 9 – Very dense (visual notes, scale from 1 to 9 )                                  |
| Awn (FAO notes)                     | 0 – without awn; 1 – short awn; 7 – high awn.   |
| Color of the glumes (FAO notes)     | 1 – white; 2 – red to brown; 3 – purple to black.   |
| Presence of hair/glumes (FAO notes) | 0 – absent; 3 – low; 7 – significantly.   |
| Number of spikelets/spike           | Average number of spikelets per spike in 5 spikes selected from a sample  |
| Number of seeds/spikelets           | Average number of seeds in a spike - obtained from the central area of the spike. Use 5 spikes from each sample                       |



## Results and Discussions

Pearson's correlation analysis (Figure 1) showed that the number of seeds/spikelet (**Sd/Sp**) (**0.912\*\***) and glumes colour **GIC** (**0.5\***) has a positive and significant association with the number of spikelets/spike (**Sp/SP**). Also, the number of tillers/plant (**Till/PI**) showed a positive and significant correlation with the number of seeds/plant (**Sd/PI**) (**0.587\*\***) and seed weight/plant (**SdW/PI**) (**0.448\***).

Plant height (**PIH**) showed a negative and significant correlation with the number of seeds/spikelet **Sd/Sp** (**-0.629\*\***).

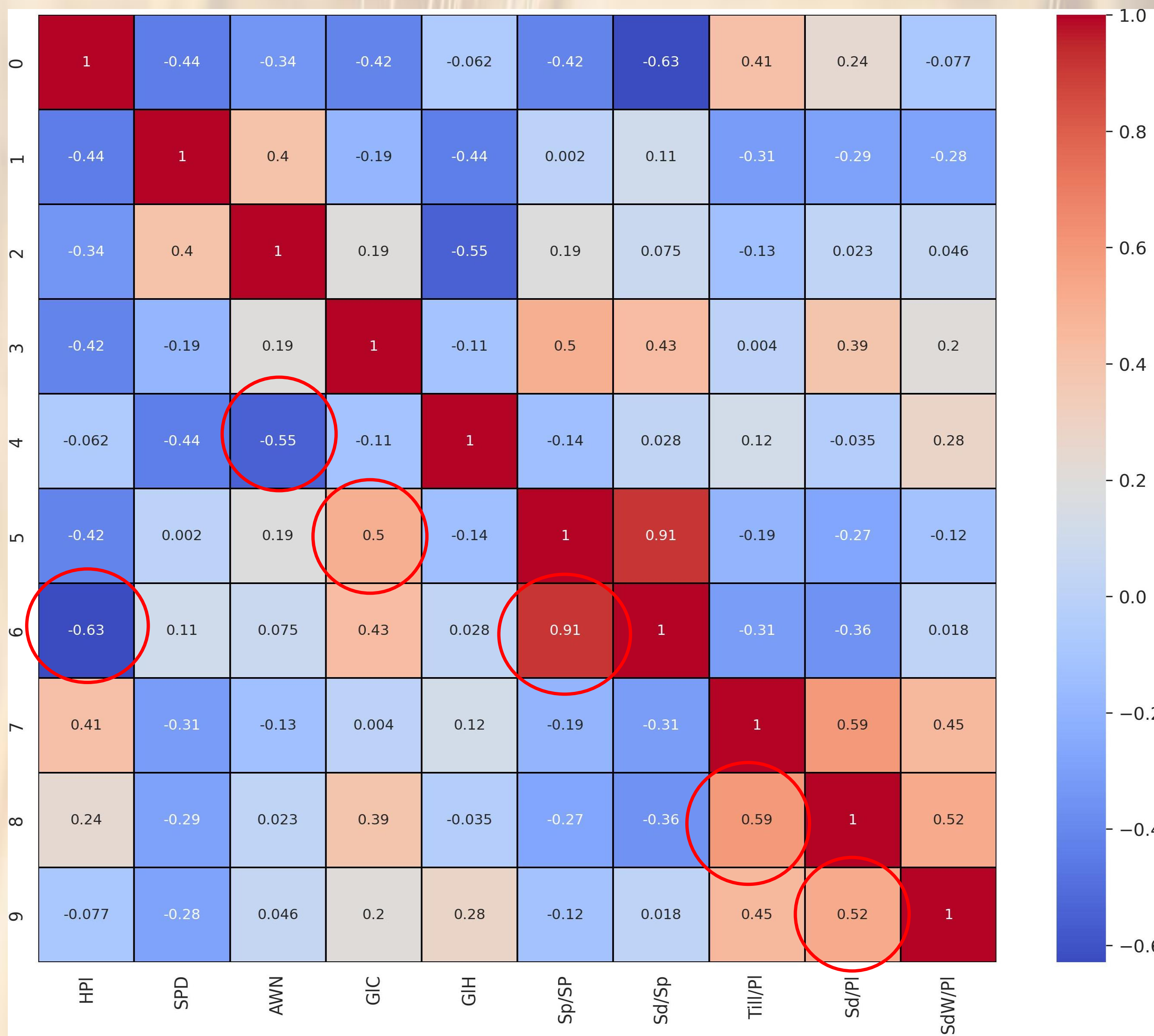


Figure 1 - Pearson correlation heatmap for the germplasm studied

## Conclusions

The Pearson correlation coefficients obtained for the analyzed wheat genotypes highlight the relationships that exist between different traits. This can improve the efficiency of the selection process for the most productive cultivars that can be introduced into new wheat breeding programs.

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