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Variation of biological and economic yield in wheat cultivars (*Triticum aestivum* L.)

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Introduction

Biological yield (biomass) in terms of dry-matter (straw+grain) yield and grain yield measured in weight per unit area (g m^{-2} , kg ha^{-2}), variate in dependence of genotype, environments and interaction of genotype/environment (Fischer et al., 2012). Breeders are focused on increasing above ground biomass and grain yield. Genetic constitution of cultivars, soil fertility, nutrient, efficiency of absorption of mineral elements and water are in relationships to synthesis of organic matter, translocation and reutilization for production of dry matter i.e. biological and economics yield are important factors (Katsura et al., 2010; Knežević et al., 2015). The aim of this study was to evaluate the variability of mass of plant (biological yield) and grain mass plant^{-1} (economics yield) in genetically divergent wheat cultivars grown in different environmental conditions

Materials and methods

The twenty genetically divergent winter wheat cultivars were used for study biomass in terms of dry-matter yield of straw and grains of wheat and seed production in terms of grain yield - grain mass plant^{-1} (economic yield) were studied. during two year (2015-2017). The experiment was performed in randomized block design in three replication on the field in Kraljevo, Serbia. The seeds of varieties were sown at the distance of 0.05m in rows of 1m length among which was the distance of 0.2m. For analysis of number of seed and mass of seed spike⁻¹ were used 60 plants in full maturity stage (20 plants per replication). The significant differences between the average values were estimated by F-test values. The analysis of variance was performed according to a random block system with one factor.

Results and discussion

The mass of plant in first year of experiment varied in ratio of 26.31- 42.81g with average value 34.72g, while in second year varied from 30.00 to 45.10g with average value 39.43g seed. Mass of seed plant^{-1} in first year of experiment varied in interval of 10.83 g -16.40g g

with mean value 13.32g, while in second year grain mass varied between 10.87g and 16.26 g with average value 13.01g (tab. 1). The obtained results showed significant differences in the average values of mass of plants and mass of seed plant⁻¹ per year, that indicating diversity of studied cultivars. Similar results were reported in previous investigation (Knezevic et al., 2010).

Table 1: Variability of biological yield and economics yield of wheat plant cultivars

Cultivars	Mass of plant (Yield of biomass)			Mass of seed plant ⁻¹ (Yield of grain)		
	First year	Second year	Cultivars	First year	Second year	Cultivars
Evropa 90	26.31j	30.00g	28.16	11.39ghi	10.87i	11.13
Dejana	29.03hi	35.97ef	32.50	10.83i	11.40hi	11.11
Sila	28.07ij	39.40bcde	33.74	11.76fghi	14.63abcd	13.19
Omega	32.18fg	42.86abc	37.52	12.76defgh	15.29ab	14.02
Lasta	30.84gh	45.25a	38.04	12.84defg	16.26a	14.55
Milica	32.58fg	40.52bcd	36.55	12.41efghi	11.65fghi	12.03
Partizanka	31.29gh	45.10a	38.19	11.79fghi	13.85bcdef	12.82
Pobeda	36.95cde	38.85bcdef	37.90	15.68ab	12.98cdefghi	14.33
Dična	38.32bcd	35.66ef	36.99	14.83abc	12.99cdefghi	13.91
NSR-5	38.43bcd	36.92def	37.68	15.32ab	11.95efghi	13.63
Alfa	38.44bcd	37.17def	37.80	16.40a	12.41defghi	14.40
Rodna	31.54gh	34.36fg	32.95	11.19hi	10.92hi	11.05
Agrounija	36.88cde	40.84abcd	38.86	14.66bc	13.02cdefghi	13.84
Zadruga	34.39ef	42.73abc	38.56	13.62cde	15.18abc	14.40
KG -75	38.64bc	41.33abcd	39.98	13.38cdef	13.14bcdefgh	13.26
Šumadinka	36.94cde	35.88ef	36.41	14.18bcd	11.56ghi	12.87
Levčanka	40.67ab	42.15abc	41.41	14.20bcd	14.03ebcde	14.11
Oplenka	42.81a	38.38cdef	40.59	14.71bc	12.14efghi	13.42
Gruža	34.42ef	42.95ab	38.68	12.31efghi	13.80bcdefg	13.05
KG-56	35.94de	42.21abc	39.08	12.08efghi	12.09efghi	12.08
Average	34.73	39.43	-	13.32	13.01	-
LSD (0.05)	2.618	4.515	-	1.633	2.257	-
LSD (0.01)	3.578	6.171	-	2.232	3.086	-

Conclusions

The differences among wheat cultivars were significant for analyzed traits: biological yield (mass of plant) and economics yield (grain mass plant⁻¹) in both year of investigation.

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