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Original scientific paper

KHORASAN WHEAT POPULATION RESEARCHING (*Triticum turgidum, SSP. turanicum* (McKEY) IN THE MINIMUM TILLAGE CONDITIONS

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Khorasan wheat occupies a special place in the group of new-old cereals (*Triticum turgidum, ssp. Turanicum* McKey). It is an ancient species, native to eastern Persia, that is very close to durum wheat by morphological characteristics. Investigations were carried out in agro ecological conditions of the eastern Srem, with two wheat populations with dark and bright awns as objects of study. The following morphological and productive characteristics were investigated: plant height (PH), spike length (SH), number of spikelets per spike (NSS), absolute weight (AW) and grain weight per spike (GW), seed germination (G) and grains yield (YG). Field micro-experiments were set on the carbonate chernozem soil type on loess plateau in 2011 and 2012. Hand wheat sowing was conducted in early March with drill row spacing of 12 cm. The experiment was established as complete randomized block system with four replications. Tending crops measures were not applied during the growing season. Plants were grown without usage of NPK mineral nutrients. Chemical crop protection measures were not applied, although powdery mildew (*Erysiphe graminis*) was appeared before plants spike formation in a small extent.

The results showed that both populations have a genetic yield potential. In general, both populations manifested a satisfactory tolerance on lodging and there was no seed dispersal. Plants from bright awns population were higher, had longer spikes and larger number of spikelet's per spike. However, plants from dark awns population had higher absolute weight and grains weight per spike, as well as grain yield per plant. Strong correlation connections were identified among the investigated characteristics. The determination of

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correlations, as well as direct and indirect affects, enabled easier understanding of the mutual relationships and their balancing in order to improve the yield per unit area.

Key words: *Triticum turgidum*, population with dark and bright awns, genetic potential, morphological and productive characteristics.

INTRODUCTION

Khorasan wheat (*Triticum turgidum, ssp. turanicum* McKey) represents an ancient species that is in accordance with morphological characteristics close to durum wheat (SACKS, 2005). Although there is no data on its origin, according the DNA analysis, this species is most likely originated from spontaneous crossbreeding between field and durum wheat (KHLESTKINA *et al.,* 2006). Khorasan wheat (engl. Kamut) was grown in ancient Egypt 4,000 years ago, known as the Tutankhamun or Pharaoh wheat. An American scientist Bob Quinn gave the commercial name – kamut to this type of wheat in 1990 and introduced it into commercial production on the Americas (GLAMOCLIJA *et al.,* 2012). Khorasan wheat is characterized with a high genetic yield potential (Fig. 1, 2). In addition, it exhibits greater tolerance to drought and pests, and shows that it has a significantly higher coefficient of plant asimilativ usage from the soil than soft wheat (GLAMOCLIJA *et al.,* 2012).

Pict.1. *Triticum turgidum*

Kamut grain is 20-30% larger and has significantly higher nutritional value compared with the grain of the most widespread species of soft wheat. There are 20-40% more total proteins than common wheat, and essential amino acids for about 65%. In addition, it is richer in the oils content, vitamins and mineral salts.

Due to the increased content of mono-saccharides it has a sweet taste so it is called sweet wheat, also. Flour obtained by kamut grain grinding is addition to the wheat flour in a different proportions and is in usage for bread and baking products of increased nutritional and energy values making, for example, a special bread, biscuits, pasta, pastries or pancakes. Such groceries are suitable for physically more active people nutrition. According to IFAA (International Food Allergy Association) investigations, the kamut flour has less gluten, so this groceries are suitable for the people who are allergic to this protein (GLAMOCLIJA *et al.,* 2012).

Wheat breeding to productivity, videlicet on yield increasing by certain plant characteristics changing, has always been the main goal of breeding process (HRISTOV *et al*., 2008). Determining of the attributes that are important for the selection process in breeding applying based on the model is particularly important, as well as definning their desired values and their interrelations. Breeding for yield perse ultimately consist of breeding for certain traits while maintaining a harmonious interrelations among them. By changing the individual components of yield and harvest index, what individually presents breeding over variety model, the yield of wheat was increased (GLAMOCLIJA *et al.,* 2012). As demand for alternative grains increasing in the world market, there should pursue opportunities to advance our rural areas, where there are natural resources for the production of the crop plants.

Pic. 2. Kamut grain

Traditional production of the most abundant crop plants of sterling wheat grains, barley and oats, often does not meet the needs of the household because the yields of these products run from the application of inappropriate agricultural techniques. Good production characteristics have included Kamut in the system of ecological farming (organic farming). The increasing demand for groceries based on flour caused the increase in the area under this type of wheat. Thanks to expressed ksero-morphological structure, it better tolerates drought and high air temperatures and it is tolerant to pathogens. Kamut has a high yield potential and responds very well on increased plant nutrition both yield and grain quality. On the other hand, it can be grown in less favorable agro-ecological and soil conditions than common wheat. Kamut is suitable for production in the highland areas with poorer soils and extensive use of agricultural technology (GLAMOCLIJA *et al.,* 2012). Alternative grain products are highly appreciated for storing high-quality as safe food (POPOVIC *et al.,* 2012, RAKIC *et al.,* 2013, IKANOVIC *et al.,* 2013, JANKOVIC *et al*, 2013).

Meteorological conditions have significant affect on the productivity and grain quality (POPOVIC *et al*., 2011, GLAMOCLIJA *et al.,* 2013). Improvement of the crop production general conditions in mountainous areas without major investments in agricultural technology can be achieved by modifying the structure of sowing. So instead of winter wheat, which yields on poor soils and whit application of inadequate nutrition of plants not exceeding 3,000 kg ha^{-1}, should be sown any other sterling cereals that are better adapted to the agro-ecological conditions of these areas. These are triticale, krupnik wheat and bare oat, respectively the sterling grains that are due to their high nutritional value, more and more in the usage directly for human consumption or for the preparation of groceries that are categorized as functional and safe food. Total crop production would be significantly increased by changing of maize varieties assortment.

As the demand for products made of alternative grains increasing in the world market, Khorasan wheat should be included in the production, with the aim of our rural areas prosperity, where there are natural resources for the production of this kind of the crop plants. The aim of this investigation was to determine the correlations, as well as direct and indirect affects and allowing an easier understanding of interrelations population with dark and bright awns, their balancing and Khorasan wheat populations yields improvement per unit area.

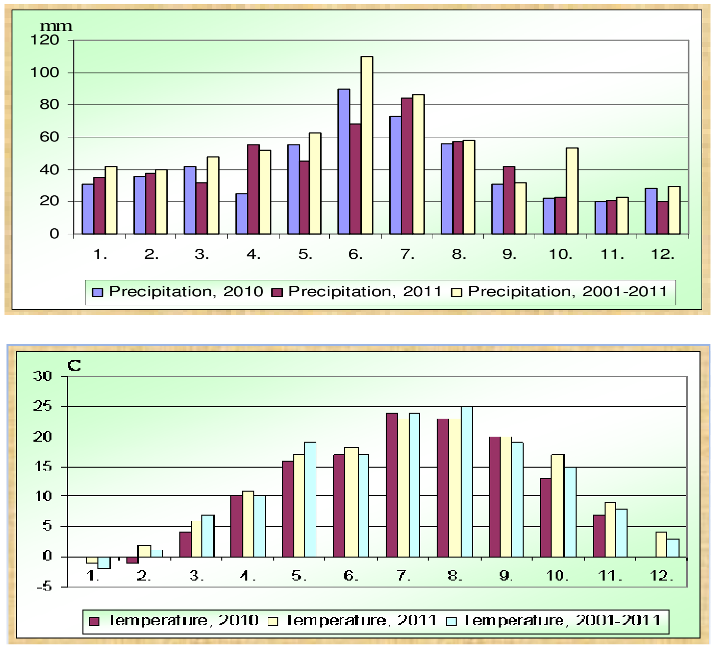
MATERIALS AND METHODS

Investigations were carried out in the eastern agro-ecological conditions of Srem in Nova Pazova. The subject of the investigation was korason wheat population with dark and bright awns. The folowing morphological and productive characteristics were investigated: plant height (PH), spike length (SH), number of spikelets per spike (NSS), absolute weight (AW) and grain weight per spike (GW), seed germination (G) and grains yield (YG). Field micro-experiments were set during 2011 and 2012 on loess plateau on carbonate chernozem soil type in New Pazova. Kamut preceding crop was potatoes. Hand sowing of wheat was conducted in early March in both years with 12 cm rows distance. The experimental design was a randomized complete block system with four replications. Tending crops measures were not applied during the growing season. Plants were grown without NPK mineral nutrients usage.

Chemical crop protection measures were not applied, although powdery mildew (*Erysiphe graminis*) had appeared to a small extent before plants heading. Harvesting was performed on July the 7th in 2011 and July the 10th in 2012. Before harvest, samples for determination of the following parameters were taken: plant height, spike length, number of spikelets, grain number per spike, grain weight and seed germination. Morphological characteristics were analyzed after the crop harvest and yields per unit area were calculated. All data were processed with statistical analysis for double-factorial experiments.

The most important meteorological indices were monitored and analyzed during the study - distribution and amount of precipitation and thermal conditions during the plants growing season (Graph. 1 and 2). Data on monthly rainfall and air temperatures for the 2011/12 ware taken from the Hydro-meteorological Service of Serbia, for New Pazova.

The total amount of precipitation during 2010 and 2011 (509 mm and 520 mm) were relatively uniform and were lower than long-term average of 117 mm and 128 mm. In 2010, the average temperature was 12.09 °C and was lower for 0.33 °C compared to 2011, respectively for 1.36 °C compared with the long-term average (Graph. 1 and 2).



Graph.1, 2. Total precipitation (mm) and average temperature (°C), New Pazova, 2010-2012

Meteorological conditions, such as temperature evolution, light duration and intensity, and precipitation amount and distribution, as well as how much the crops is affected by diseases, pests and weeds, are the main factors which influence the crop yield variability from year to year. This variability is in inverse relationship with yield stability. Yield fluctuation becomes more a concern in the actual global climate change projections (COCIU, 2012).

RESULTS AND DISCUSSION

Morphological and productive characteristics of Khorasan wheat

Biannual investigation results of the affect of agro-meteorological conditions on morphological and productive characteristics of Khorasan wheat showed that they significantly affect on this alternative grain production success. Year, genotype and their interaction had a significant affect on plant height, spike length and the absolute grain weight, $p \leq 0.05$. Among the investigated years at tested genotypes there were no significant differences for following morphological features: germination, spike length and grain weight per spike. Observed genotypes had on an average high germination of 98.45 and high seed weight of 1.38 g (Tables 1 and 2).

Investigations show that among tested genotypes statistically significant differences were achieved on plant height, spike length and absolute weight. The plants were significantly higher in 2011 (71.92 cm, 73.36 cm) compared with 2010th (70.88 cm, 72.42 cm). Absolute weight of produced seeds was significantly higher in 2010 (68.3 g, 66.96 g) compared with 2011 (67.74 g, 66.36 g), at both tested genotypes (Table 1). Genotypes with bright awns had significantly longer spike (7.16 cm) and plant height (72.89 cm), but plants with dark awns had significantly greater absolute grain weight of 68.02 g (Table 1).

The interaction G x Y had significantly affect on the spikelets number (table 1). Dark awns genotype had a higher number of spikelets (16.22) in 2010 compared with light awns genotype (15.76) and smaller number during the 2011th (Table 1).

Table 1. Morphological traits of the populations Khorasan wheat, 2010-2011

Morphological traits	Khorasan wheat genotypes							
	Population with dark awns			Population with bright awns			Average	
	2010	2011	Average	2010	2011	Average	2010	2011
Germination	98.20	98.40	98.3	96.00	97.20	96.6	97.1	97.8
	$LSD_{AB, 0.05}$	4.10		$LSD_{B, 0.05}$	2.9		$LSD_{A, 0.05}$	2.9
	$LSD_{AB, 0.01}$	5.75		$LSD_{B, 0.01}$	4.06		$LSD_{A, 0.01}$	4.06
The absolute weight, g	68.3	67.74	68.02	66.96	66.36	66.66	67.63	67.05
	$LSD_{AB, 0.05}$	0.72		$LSD_{B, 0.05}$	0.51		$LSD_{A, 0.05}$	0.51
	$LSD_{AB, 0.01}$	1.00		$LSD_{B, 0.01}$	0.71		$LSD_{A, 0.01}$	0.71
Grain weightper spike, g	1.44	1.35	1.40	1.36	1.34	1.35	1.40	1.35
	$LSD_{AB, 0.05}$	0.11		$LSD_{B, 0.05}$	0.08		$LSD_{A, 0.05}$	0.08
	$LSD_{AB, 0.01}$	0.16		$LSD_{B, 0.01}$	0.11		$LSD_{A, 0.01}$	0.11
Number of spikelets per spike	16.22	15.36	15.79	15.76	15.84	15.8	15.99	15.60
	$LSD_{AB, 0.05}$	0.40		$LSD_{B, 0.05}$	0.28		$LSD_{A, 0.05}$	0.28
	$LSD_{AB, 0.01}$	0.56		$LSD_{B, 0.01}$	0.39		$LSD_{A, 0.01}$	0.39
Spike length, cm	6.84	6.7	6.77	7.08	7.24	7.16	6.96	6.97
	$LSD_{AB, 0.05}$	0.34		$LSD_{B, 0.05}$	0.24		$LSD_{A, 0.05}$	0.24
	$LSD_{AB, 0.01}$	0.47		$LSD_{B, 0.01}$	0.33		$LSD_{A, 0.01}$	0.33
Plant height, cm	70.88	71.92	71.40	72.42	73.36	72.89	71.65	72.64
	$LSD_{AB, 0.05}$	0.98		$LSD_{B, 0.05}$	0.70		$LSD_{A, 0.05}$	0.70
	$LSD_{AB, 0.01}$	1.38		$LSD_{B, 0.01}$	0.97		$LSD_{A, 0.01}$	0.97

Table 2. Analysis of variance of morphological traits of populations Khorasan wheat

Morphological characteristics	Effect	DF	MS	F		LSD Test	
						0.05	0.01
Germination	Year, A	1	14.450	1.634	ns	2.90	4.06
	Genotyp, B	1	2.450	0.277	ns	2.90	4.06
	Interaction, AB	1	1.250	0.141	ns	4.10	5.75
	Error	12	8.842				
The absolute weight	Year, A	1	1.682	6.224	*	0.51	0.71
	Genotyp, B	1	9.248	34.220	**	0.51	0.71
	Interaction, AB	1	0.002	0.007	ns	0.72	1.00
	Error	12	0.270				
Grain weight per spike	Year, A	1	0.015	2.269	ns	0.08	0.11
	Genotyp, B	1	0.010	1.461	ns	0.08	0.11
	Interaction, AB	1	0.006	0.841	ns	0.11	0.16
	Error	12	0.007				
No. of spikelets per spike	Year, A	1	0.760	9.153	*	0.28	0.39
	Genotyp, B	1	0.0005	0.006	ns	0.28	0.39
	Interaction, AB	1	1.105	13.294	**	0.40	0.56
	Error	12	0.083				
Spike length	Year, A	1	0.0005	0.008	ns	0.239	0.334
	Genotyp, B	1	0.760	12.693	**	0.239	0.334
	Interaction, AB	1	0.113	1.878	ns	0.337	0.473
	Error	12	0.060				
Plant height	Year, A	1	4.901	9.626	**	0.70	0.97
	Genotyp, B	1	11.101	21.805	**	0.70	0.97
	Interaction, AB	1	0.012	0.025	ns	0.98	1.38
	Error	12	0.509				

ns- non significante, * and ** significant at $p \leq 0.05$ and $p \leq 0.01$

Yield of the populations of Khorasan wheat

The yield is the most important economic characteristic, polygenic inherited and strongly influenced by environmental factors (POPOVIC *et al.,* 2012, SIKORA *et al.,* 2013, GARRIDO *et al.,* 2013). Agronomic practices, climatic variables, and soil conditions are key factors in crop productivity (RISTIC *et al.*, 2009, GORJANOVIC *et al.,* 2010, HIRZEL and MATUS, 2013). Genotype and G x Y interaction had a statistically great influence on the grain yield, $p \leq 0.01$ (Tables 3, 4).

Table 3. Yield of the populations of Khorasan wheat, 2010-2011

Parameter	Genotyp, B	Year, A	$\bar{X}$	Average B	LSD_{AB}	
					0.05	0.01
Yield, kg/ha	Population with dark awns	2010	4352	4348	89	123
		2011	4346			
	Population with bright awns	2010	4113	4193		
		2011	4254			
	Average A	2010	4241			
		2011	4230			

The year, based on the F test of variance analysis had no statistically significant affect on average seed yield. There are obvious significant differences in yields, depended on the cultivated genotype (Tables 3 and 4).

The average yield for Khorasan genotype with dark awns amounted 4348 kg / ha and was statistically significantly higher than in Khorasan genotype with bright awns (4193 kg / ha).

Table 4. Analysis of variance of yield populations of Khorasan wheat

Parameter	Effect	DF	MS	F		LSD Test	
						0.05	0.01
Yield	Year, A	1	17464	4.00	ns	62.96	87.14
	Genotyp, B	1	120901*	27.66	**	62.96	87.14
	Interaction, AB	1	20416*	4.67	**	89	123
	Error	16	4371				

ns- non significante, * and ** significant at $p \leq 0.05$ and $p \leq 0.01$

Differences related to average yields of genotype with dark awns, among years, were not statistically significant, while the differences in yields of genotype with bright Khorasan awns, among years, were statistically significant, $p \leq 0.05$. We ended from the results that the Khorasan genotype with dark spikes was more adaptable and robust compared to Khorasan genotype with bright spikes.

The correlations of the khorasan wheat investigated characteristics

Analysis of individual Khorasan wheat characteristics contribute to greater efficiency on yield components breeding. The yield was in positive non significant correlated interrelation with spikelets number in the spike and grain weight and in the non significant correlation with plant height and spike length. Plant height was in positive significant correlation with spike length, r = 0.48 *, and negatively correlated with the number of spikelets and grain weight.

Table 5. Correlation interrelations of populations Khorasan wheat investigated characteristics

Parameters	Yield	Plant height	Spike length	No. of spikelets per spike	Grain weight per spike
Yield	1,00	-0,29 ^{ns}	-0,41 ^{ns}	0,20 ^{ns}	0,23 ^{ns}
Plant height	-0,29 ^{ns}	1,00	0,48 *	-0,21 ^{ns}	-0,30 ^{ns}
Spike length	-0,41 ^{ns}	0,48 *	1,00	0,12 ^{ns}	-0,28 ^{ns}
No. of spikelets per spike	0,20 ^{ns}	-0,21 ^{ns}	0,12 ^{ns}	1,00	0,21 ^{ns}
Grain weight per spike	0,23 ^{ns}	-0,30 ^{ns}	-0,28 ^{ns}	0,21 ^{ns}	1,00

ns- non significante, * significant at $p \leq 0.05$

The determination of correlations, as well as direct and indirect affects, enabled easier understanding of the interrelations and their balancing in order to improve the Khorasan wheat yield per unit area. Our investigation is consistent with Christ et al., 2008 research, where the authors state that the Path analysis revealed highly significant direct affects of grain per spike and 1000 grain yield per plant.

CONCLUSION

Analysis of wheat characteristics improves higher breeding efficiency on yield components. The results showed that both Khorasan wheat populations have the great genetic yield potential. In general, both populations exhibited a satisfactory tolerance to lodging and there was no seed shedding. Plants from the bright awns population were higher, had longer spikes and larger number of spikelets per spike. However, plants from the dark awns population had higher absolute mass and grains weight per spike as well as grains yield per plant. By correlations determination, as well as direct and indirect affects, it was found that plant height was positively significantly related with spike length, r = 0.48*. Grain yield was positively not significantly correlated with number of spikelets per spike and grain weight, and not significantly, negatively correlated with plants height and spike length. The determination of correlations, as well as direct and indirect affects, enabled easier understanding of the interrelationships and their balancing in order to improve the yield per unit area.

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REFERENCES

COCIU, A.I. (2012). Winter wheat yields and their stability in different crop rotation types and nitrogen fertilization regimes. Romanian Agricultural Research, Romania. No. *29,* 140-148.

GARRIDO, M., L. ROMÁN, P. SILVA, G. CASTELLARO, V.G. CORTÁZAR, E. ACEVEDO (2013): Characterization of genetic coefficients of durum wheat *(Triticum turgidum* L. ssp. *durum)* 'Llareta-INIA' and 'Corcolén-INIA' Chilean J. Agric. Res. vol.*73*, 2, pp. 91-98. ISSN 0718-5839.

GLAMOCLIJA, Đ., S. JANKOVIC, R. PIVIC (2012): Alternative Grains: economic importance, growing conditions, species and soil management. Institute of Soil Science, Zemun, ISBN: 978-86-911273-2-9, pp. 42-43.

GLAMOCLIJA, Đ., B. ZARKOVIC, S. DRAZIC, V. RADOVANOVIC, V. POPOVIC, V. URGENOVIC (2013): Morfological and productivity characteristics of spelt wheat on the chernozem and degraded soil. Proceedings of research paper. Institute of PKB Agroekonomik, Belgrade, *19* (1-2), 23-31.

GORJANOVIC, B., M. KRALJEVIC-BALALIC, S. JANKOVIC (2010): Environmental Effects on Associations among Nitrogen Use Efficiency Traits in Wheat. Cereal Research Communications, *38* (1), 146-153.

HIRZEL, J., I.MATUS (2013). Effect of soil depth and increasing fertilization rate on yield and its components of two durum wheat varieties. *Chilean J. Agric. Res.* vol.*73*, (1), pp. 55-59. ISSN 0718-5839.

HRISTOV, N., N. MLADENOV, A. KONDIC-SPIKA, S. STATKIC, N.KOVACEVIC (2008): Direct and indirect effects of several wheat traits on grain yield. Field and Crops, 2008, *45*, (2), pp. 15-20.

IKANOVIC, J., S. RAKIC, V. POPOVIC, S. JANKOVIC, DJ. GLAMOCLIJA, J. KUZEVSKI (2013). Agro-ecological conditions and morpho-productive properties of buckwheat. Biotechnology in Animal Husbandry, Belgrade. *29* (3), p 555 562, 2013. ISSN 1450-9156

JANKOVIC, S., J. IKANOVIC, V. POPOVIC, S. RAKIC, J.KUZEVSKI (2013). Agro-ecological conditions and morpho-productive properties of spelt wheat. Biotechnology in Animal Husbandry *29* (3), pp. 547-554. ISSN 1450-9156, DOI: 10.2298/BAH1303547J

KHLESTKINA, E. K., M. S. RÖDER, H. GRAUSGRUBER, A. BÖRNER (2006). "A DNA fingerprinting-based taxonomic allocation of Kamut wheat". Plant Genetic Resources *4* (3): pp. 172–180. DOI:10.1079/PGR2006120.

POPOVIC, V., Đ. GLAMOCLIJA, M. MALESEVIC, J. IKANOVIC, G. DRAZIC, M. SPASIC, S.STANKOVIC (2011): Genotype specificity in nitrogen nutrition of malting barley. Genetika, Belgrade, *43* (1), pp. 197-204. DOI: 10.2298/GENSR1101197P

POPOVIC, V., M. MALESEVIC, DJ. GLAMOCLIJA, S. VUCKOVIC, M. TATIC (2012): Effect of agro-ecological factors on wheat seed production. Scientific Journal of Univerzity of Szeged. Hodmezovasarhely, *6*, (2), pp. 150-157.

RISTIC, Z., I. MOMCILOVIC, U. BUKOVNIK, V. PRASEAD, J. FU, B. DE RIDDER, T. ELTHON, *N.MLADENOV* (2009): Rubisco activase and wheat productivity under heat-stress. Journal of Experimental Botany, *60*(14): pp. 4003-4014.

RAKIC, S., DJ. GLAMOCLIJA, J. IKANOVIC, S. JANKOVIC, M.ZIVKOVIC (2013): Morphological traits, yield and chemical composition of forage sorghum genotypes, grown under different nitrogen rates. Romanian Agricultural Research, *30.* 109-115. DII 2067-5720 RAR 195

RODRÍGUEZ-QUIJANO, M., R. LUCAS, M. RUIZ, P. GIRALDO, A.I ESPÍ, J. M. CARRILLO (2010). "Allelic Variation and Geographical Patterns of Prolamins in the USDA-ARS Khorasan Wheat Germplasm Collection". *Crop Science 50* (6), pp. 2383–2391.

SACKS, G. (2005). "Kamut: A New Old Grain". *Gastronomica* 5 (4), pp. 95–98. DOI: 10.1525/gfc.2005.5.4.95. JSTOR 10.1525/gfc.2005.5.4.95.

SIKORA, V., V. FILIPOVIC, J. BERENJI, V. POPOVIC (2013): Agro-biological traits of genotypes of common millet (*Panicum miliaceum* L.) in regular and stubble crop. Field and Vegetable Crops Research, Novi Sad. *50* (2), pp.16-23. ISSN 2217-8392

PROUČAVANJE POPULACIJA KORASAN PŠENICE (*Triticum turgidum, ssp. turanicum* (McKey) U USLOVIMA MINIMALNE OBRADE ZEMLJIŠTA

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Izvod

U grupi novih starih žita posebno mesto zauzima korasan pšenica (*Triticum turgidum, ssp. Turanicum* McKey). Korasan pšenica predstavlja drevnu vrstu, poreklom iz istočne Persije, koja je po morfološkim osobinama vrlo bliska tvrdoj pšenici. Istraživanja su izvedena u agroekološkim uslovima istočnog Srema, a predmet proučavanja bile su dve populacije ove pšenice, sa tamnim i sa svetlim osjem. Proučavane su sledeće morfološke i produktivne osobine: visina biljke, dužina klasa, broj klasića u klasu, apsolutna masa i masa zrna u klasu. Poljski mikroogledi postavljeni su 2011. i 2012. godine na zemljištu tipa karbonatni černozem na lesnoj zaravni. Ručna setva pšenice obavljena je početkom marta u redove na rastojanju 12 cm. Ogled je postavljen po slučajnom blok sistemu u četiri ponavljanja. Tokom vegetacionog perioda nisu primenjene mere nege useva. Biljke su gajene bez upotrebe NPK mineralnih hraniva. Nisu primenjene hemijske mere zaštite useva, iako se pre klasanja biljaka pojavila pepelnica (*Erysiphe graminis*) u malom stepenu.

Rezultati su pokazali da obe populacije imaju visok genetički potencijal rodnosti. U celini obe populacije ispoljile su zadovoljavajuću tolerantnost na poleganje i nije bilo osipanja zrna. Biljke populacije svetlog osja bile su više, imale su duže klasove i veći broj klasića u klasu. Međutim, biljke populacije tamnog osja imale su veću apsolutnu masu i masu zrna u klasu, kao i prinos zrna po biljci. Utvrđivanje korelativnih odnosa, kao i direktnih i indirektnih efekata, omogućilo je lakše sagledavanje međusobnih veza i njihovo balansiranje u cilju unapređenja prinosa po jedinici površine.

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