RESEARCHES REGARDING QUALITY OF ROMANIAN AND HUNGARIAN WHEAT CULTIVARS IN ZALAU MILL

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Abstract

This study try to compare properies of the wheat grains from Romania and Hungary. The study was conducted in the frame of project HURO 1001/323/2.2.2 Grains Safety during 2012 – 2013 in Zalau mill. The parameters taken in study were Hectolitric mass, 1000 kernels mass, Wet gluten percentage, Protein content, Humidity, Specific mass and Zeleny index.

Key words: wheat, grains quality, wet gluten, zeleny index, protein content.

INTRODUCTION

There is important to evaluate the wheat cultivars grains quality in order to optimized the processing and the quality of final products. The grains quality influenced also the machinery settings, adjustments and tunning. In this way parameters like Hectolitric mass, 1000 kernels mass, Wet gluten percentage, Protein content, Humidity, Specific mass and Zeleny index are important from all points of view, innocuity and yeld in processing and also from the processing procedure. Methods used for analysis are according with romanian standards and are quottation in latest studys.

MATERIAL AND METHOD

Taking samples: We use to take samples cilindrical probes. Procedure was according to Thierer (1976) and Duda (2003). Obteining working samples: We form successively elementar, brutto, homogenized, laboratory and work samples according with Mureşan et al. (1986).

Was study colour, aspect, smell and taste of grains according Thierer (1966). If this parameters was out of normal range grains were considered out of standards, affected by different kind of degradation and study of those samples was ended. Hectolitric weight was study with Granomat Pffeifer electronic device according Duda et al. (2003) and Hodisan, Timar (2010).

1000 grains weight was study with analitical ballance 0.0001 g precision range according Muresan et al. (1986), Duda et al. (2003) and Hodisan, Timar (2010).

Specific weight was study according Muresan et al. (1986) and Duda et al. (2003), using follow formula:

$m = G/V$

G – 1000 grains weight, g, V - volumme of 1 000 grains, cm^3.

Wet gluten percentage, Protein content, Humidity and Zeleny index were determined by Agricheck Bruins Instruments NIR spectometer according Duda et al. (2003) and Hodisan, Timar (2010).

RESULTS AND DISCUSSION

Results of the research were as following.

Table 1

Research results regarding grains Hectolitric mass

No.	Sample	Values (kg)			Average, kg	Diferences, %
		1	2	3		
1	DROPIA	77.5	77.4	77.5	77.46	0.9910448
2	ALEX LOT 1	77.9	77.8	77.9	77.86	0.9961620
3	ALEX LOT 2	78.2	78.1	78.2	78.16	1
4	CRIŞANA	74.4	78.5	75.5	76.13	0.9739872
5	BEKEŞ	77.8	77.9	77.4	77.77	0.9940299
6	MV KOLO	78.1	78.2	77.8	78.03	0.9982942
7	MV VEKNI	77.4	77.8	77.9	77.70	0.9940299
8	MV MARSHALL	77.8	78.2	78.2	78.06	0.9987207
9	ALEX LOT 3	76.4	77.1	77.4	76.96	0.9846482
10	MV EMESE	76.4	77.9	77.8	77.36	0.9897655
11	MV MAGDALENA	77.8	78.1	78.2	78.03	0.9982942

The maximum values of this parameter was finded in Alex cultivar (78.16 kg). There were shown that the Hungarian cultivars are superior from this point of view. That is explained by the origin of those cultiwars (Hungary) were are better croping conditions.

Table 2

Research results regarding grains 1000 kernels mass

No.	Sample	Values (g)			Average. g	Diferences. %
		1	2	3		
1	DROPIA	47.00	47.00	47.00	47.00	0.9943583
2	ALEX LOT 1	47.80	46.98	47.81	47.53	1.0055712
3	ALEX LOT 2	47.30	47.20	47.30	47.26	1
4	CRIŞANA	47.60	47.60	47.60	47.60	1.0070522
5	BEKEŞ	47.20	47.20	47.30	47.23	0.9992948
6	MV KOLO	47.60	47.80	47.80	47.73	1.0098731
7	MV VEKNI	47.20	47.30	47.20	47.23	0.9992948
8	MV MARSHALL	46.37	47.80	47.80	47.32	1.0011989
9	ALEX LOT 3	47.70	47.30	47.20	47.40	1.0028209
10	MV EMESE	46.80	47.20	48.16	47.38	1.0025388
11	MV MAGDALENA	47.80	47.30	47.80	47.63	1.0077574

The grains from the 1000 kernel mass point of view had different values. The superiority of the Hungarian cultivars were shown also. The biggest value was finded for MV KOLO cultivar**.** Alex cultivar shown values close to Hungarian cultivars.

Table 3

Research results regarding grains Specific mass

No.	Sample	Values (g/cmc)			Average. g/cmc	Diferences. %
		1	2	3		
1	DROPIA	1.23	1.23	1.23	1.23	1.1081081
2	ALEX LOT 1	1.29	1.19	1.21	1.23	1.1081081
3	ALEX LOT 2	1.09	1.05	1.19	1.11	1
4	CRIŞANA	1.19	1.14	1.20	1.17	1.0600601
5	BEKEŞ	1.22	1.21	1.19	1.20	1.0870871
6	MV KOLO	1.16	1.18	1.18	1.17	1.0570571
7	MV VEKNI	1.26	1.23	1.33	1.27	1.1471471
8	MV MARSHALL	1.31	1.27	1.30	1.29	1.1651652
9	ALEX LOT 3	1.11	1.14	1.19	1.14	1.0330330
10	MV EMESE	1.22	1.24	1.22	1.22	1.1051051
11	MV MAGDALENA	1.12	1.15	1.13	1.13	1.0210210

The specific mass maximal values were finded in Hungarian cultivars MV VEKNI and MV MARSHALL. The Romania cultivars shown also values very close to maximal values determined. The best Romanian cultivar were also Alex.

Table 4

Research results regarding grains Wet gluten

No.	Sample	Values (%)			Average. %	Diferences. %
		1	2	3		
1	DROPIA	25.12	24.62	25.32	25.02	1.0041472
2	ALEX LOT 1	24.42	25.32	25.02	24.92	1.0001338
3	ALEX LOT 2	25.09	24.79	24.87	24.91	1
4	CRIŞANA	26.12	26.22	25.82	26.05	1.0456187
5	BEKEŞ	27.11	26.61	26.73	26.81	1.0762542
6	MV KOLO	26.02	26.09	26.12	26.07	1.0465552
7	MV VEKNI	25.23	25.33	25.53	25.36	1.0179264
8	MV MARSHALL	25.14	25.24	24.94	25.10	1.0076254
9	ALEX LOT 3	25.34	25.34	25.34	25.34	1.0169900
10	MV EMESE	27.11	27.21	27.01	27.11	1.0880268
11	MV MAGDALENA	26.21	25.91	26.14	26.08	1.0469565

The biggest value of wet gluten percentage were finded in Hungarian MV EMESE. The value were very close to Romanian Crisana cultivar. The rest of Romanian cultivars were under Hungarian bulks.

Table 5

Research results regarding grains Wet gluten

No.	Sample	Values (%)			Average. %	Diferences. %
		1	2	3		
1	DROPIA	13.8	13.65	13.62	13.69	1.0463694
2	ALEX LOT 1	13.5	13.35	13.42	13.42	1.0259873
3	ALEX LOT 2	13.45	12.85	12.95	13.08	1
4	CRIŞANA	13.22	13.28	13.21	13.23	1.0117197
5	BEKEŞ	13.8	13.56	13.58	13.64	1.0430573
6	MV KOLO	13.5	13.32	13.39	13.40	1.0244586
7	MV VEKNI	13.8	13.67	13.19	13.55	1.0359236
8	MV MARSHALL	13.5	13.43	13.25	13.39	1.0236943
9	ALEX LOT 3	13.8	13.71	13.41	13.64	1.0425478
10	MV EMESE	13.5	13.28	13.12	13.30	1.0165605
11	MV MAGDALENA	13.45	12.81	13.25	13.17	1.0066242

The biggest values for this parameter were finded in Romanian cultivars. Dropia were the best cultivar finded. Only the BEKEŞ cultivar was close for the maximal values.

Table 6

Research results regarding grains Humidity

No.	Sample	Values (%)			Average. %	Diferences. %
		1	2	3		
1	DROPIA	12.4	12.23	12.34	12.32	0.9858667
2	ALEX LOT 1	12.11	12.21	12.32	12.21	0.9770667
3	ALEX LOT 2	12.9	12.76	12.85	12.83	0.9688393
4	CRIŞANA	12.4	12.6	12.31	12.43	0.9949333
5	BEKEŞ	12.67	12.47	12.54	12.56	1.0048000
6	MV KOLO	12.42	12.22	12.16	12.26	0.9813333
7	MV VEKNI	12.32	12.12	12.21	12.21	0.9773333
8	MV MARSHALL	13.01	12.88	13.12	13.00	1.0402667
9	ALEX LOT 3	12.16	12.26	12.32	12.24	0.9797333
10	MV EMESE	12.88	12.57	12.92	12.79	1.0232000
11	MV MAGDALENA	12.78	12.65	12.59	12.67	1.0138667

The humidity of the samples shown that temporary storage was well conducted. There were no significant deviation from the value 12.50%.

Table 7

Research results regarding grains Zeleny index

No.	Sample	Values (%)			Average. %	Diferences. %
		1	2	3		
1	DROPIA	64	66	61	63.66	0.8761468
2	ALEX LOT 1	74	76	75	75.00	1.0321101
3	ALEX LOT 2	73	71	74	72.66	0.5813333
4	CRIŞANA	71	68	65	68.00	0.9357798
5	BEKEŞ	72	74	68	71.33	0.9816514
6	MV KOLO	71	65	67	67.66	0.9311927
7	MV VEKNI	66	63	61	63.33	0.8715596
8	MV MARSHALL	67	60	71	66.00	0.9082569
9	ALEX LOT 3	69	73	73	71.66	0.9862385
10	MV EMESE	65	69	61	65.00	0.8944954
11	MV MAGDALENA	62	61	64	62.33	0.8577982

The best cultivar from backing capacity were Alex. Very close of him were BEKEŞ cultivar. The rest of samples had significant lower values.

CONCLUSIONS

The results shown that there Hungarian cultivars that were imported had better quality than Romanian cultivars.

Only ALEX cultivar were superior or similar. especialy from backing properties.

Because results shown that genetic potential is similar for cultivars from Romania and Hungary there is obvious that croping conditions and croping technologies are most important. Imported cultivars had better index but not significant.

Considering hard croping conditions from Romania and obsolete croping technologies we recomand Romanian cultivars that shown good production. resistence and quality.

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