

**STUDY REGARDING THE QUALITY OF TRITICALE IN SOUTHERN PLAIN AND DOBROGEA**

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**Abstract**

*The work paper gives a view of the quality average of triticale in the counties of Southern Plain and Dobrogea, in order to use in milling-bakery industry. Growth of triticale agricultural surfaces, derives from the very good properties it, the interest for this crop being justified. In investigated period it was not found bunt grains and ergot for any variety cultivated in Southern Plain and Dobrogea.*

Keywords: triticale, kernels, quality indicators

**1. INTRODUCTION**

Cereales are cultivate on all agricultural world area. In last time the surfaces cultivated with triticale have increased, in special in special in dry areas.

Official, after FAO datebase, Romania has grown triticale starting with 2003, when average production was 1.893 kg/ha. In last 20 years, average global production of triticale has around 3.500 kg/ha(+/- 200 kg g/ha).

Triticale has milling and baking qualities significantly lower than wheat. Triticale kernels are used in animals feeding, as green or silage feed and could be used also in human nutrition. This cereale has a high protein content, potasium, phosphorus, sodium, magnesium and zinc. This kernels could be used also in malt production to beer manufacturing.

In order to have quality bakery products, we must to have a high quality of wheat used as raw material in milling-bakery industry. The study had as principal purpose to identification of biological material assortment of triticale used to agricultural surface sowing in counties from Southern Plain and Dobrogea, as well as determination of the qualitative potential of this varieties.

The Area of Southern Plain and Dobrogea include the folwing counties: Brăila, Călărași, Constanța, Giurgiu, Ialomița, Ilfov, Telorman, Tulcea and agricultural area of Bucharest.

**2. MATERIAL AND METHOD**

The biological material used in this study consisted of all the triticale varieties cultivated in Southern Plain and Dobrogea: Bucuresti, Prospect, Stil, Titan and mixed varieties.

The cereals saples taked from the field were subjected to a set of analyses, regarding determination of bakery products, as following indicators:

- weight kg/hl;
- moister %;
- falling number sec;
- protein content %;
- broken and shrivelled grains %;

- Fusarium %;
- grains attacked by wheat bedbug %;
- sprouted grains %;
- toxic and/or harmful seeds %;
- ergot.

**3. RESULTS AND DISCUCTIONS**

In table 1, we can see that in Southern Plain and Dobrogea (Braila and Ilfov counties), in first year of study, the highest weight value was in Braila (74,10 kg/hl), the lowest value in Ilfov, the average of area being 74,00 kg/hl. The Falling Number had very good values in Braila (213,00 sec.) and satisfactory values in Ilfov (346,00 sec.). Triticale harvest had an average protein contgent of 10,7%, with values between 9,30% in Ilfov and 10,84% in Brăila.

Broken and shrivelled grains it was observed in both counties, but with value over 3% only in Brăila (10,14%). Have not found grains attacked *Fusarium* or wheat bedbug (*Eurygaster integriceps*), sprouted grains or ergot in all counties of Southern Plain and Dobrogea cultivated with triticale this year.

Triticale varieties seeded in Southern Plain and Dobrogea in first year of study had close values for weight; the maximum was found at Titan variety (74,10 kg/hl) and the lowest value at mixed varieties (73,90 kg/hl).

Triticale varieties seeded in this year had a average protein content under 11%; Titan variety had 10,84% and mixed varieties only 9,30%.

This year recorded broken and shrivelled grains at all varieties studied, but with values over 5% only at Titan variety (10,14%). Have not found grains attacked *Fusarium* or cereales bedbug (*Eurygaster integriceps*), sprouted grains or ergot at none of the triticale samples analized.

In second year of study (table 2) in Southern Plain and Dobrogea counties the highest value of weight was in Ilfov (79,80 kg/hl), the lowest in Tulcea (69,50 kg/hl), the average area being 75,75 kg/hl. Falling number had

good and very good values in all counties (180-250 sec.). In this year, the triticale harvest had an average protein content of 10,87%, with maximum 12,39% in Ilfov county and minimum 9,40% in Teleorman. Presence of broken and shrivelled grains have been observed with low value only in Teleorman (2,68%); in the rest of counties values was over 5%, with a maximum in Tulcea (10,96%) and an average value of 6,32%.

**Table 1a. Average quality of Triticale harvest in Southern Plain and Dobrogea**

**-first year of study-**

County/ Variety	Physico-chemical Indicators			
	Weight (kg/hl)	Moister (%)	Falling Number (sec)	Protein content (% s.u.)
County harvest quality				
Brăila	74,10	10,18	213,00	10,84
Ilfov	73,90	8,70	346,00	9,30
<b>Average</b>	<b>74,00</b>	<b>9,44</b>	<b>279,50</b>	<b>10,07</b>
Variety harvest quality				
Titan	74,10	10,18	213,00	10,84
Mixed varieties	73,90	8,70	346,00	9,30

**Table 1b. Average quality of Triticale harvest in Southern Plain and Dobrogea**

**-first year of study-**

Conty /Variety	Impurities						
	Broken and shrivel led grains (%)	Fusari m grains (%)	Attack od grains bedbug (%)	prouted grains (%)	Harmf ul and/ or toxic grains (%)	Bunt grains (%)	Ergot (%)
County harvest quality							
Brăila	10,14	0	0	0	0	0	0
Ilfov	2,99	0	0	0	0	0	0
<b>Average</b>	<b>6,56</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Variety harvest quality							
Titan*	10,14	0	0	0	0	0	0
Mixed varieties	2,99	0	0	0	0	0	0

**Table 2a. Average quality of Triticale harvest in Southern Plain and Dobrogea**

**-second year of study-**

County/ Variety	Physico-chemical Indicators			
	Weig ht (kg/h l)	Moister (%)	Falling Number (sec)	Protein content (% s.u.)
County harvest quality				
Brăila	75,50	11,71	199,00	10,22
Ilfov	79,80	11,60	231,00	12,39
Teleorman	74,20	11,30	213,00	9,40
Tulcea	69,50	12,00	238,00	11,50
<b>Average</b>	<b>74,75</b>	<b>11,65</b>	<b>220,25</b>	<b>10,87</b>
Variety harvest quality				
Mixed varieties	74,20	11,30	213,00	9,40
Bucuresti	79,80	11,60	231,00	12,39
Prospect	69,50	12,00	238,00	11,50
Stil	75,50	11,71	199,00	10,22

**Table 2b. Average quality of Triticale harvest in Southern Plain and Dobrogea**

**-second year of study-**

County / Variety	Impurities						
	Broken and shrivel led grains (%)	Fusa rium grains (%)	Attack ed grains bedbug (%)	Sproute d grains (%)	Harmfu and/or toxic grains (%)	Bunt grains (%)	Ergot (%)
County harvest quality							
Brăila	5,68	0,12	1,56	0	0	0	0
Ilfov	6,01	0,32	0,05	0,27	0,13	0	0
Teleorm an	2,68	0	0,73	0,13	0,20	0	0
Tulcea	10,96	0,05	1,13	0	0	0	0
<b>Averag e</b>	<b>6,32</b>	<b>0,12</b>	<b>0,86</b>	<b>0,10</b>	<b>0,08</b>	<b>0</b>	<b>0</b>
Variety harvest quality							
Mixed varieties	2,68	0	0,73	0,13	0,20	0	0
Bucure sti	6,01	0,32	0,05	0,27	0,13	0	0
Prospe ct	10,96	0,05	1,13	0	0	0	0
Stil	5,68	0,12	1,56	0	0	0	0

*Fusarium* attack was observed just in some counties with values below 0,5%; in Teleorman has not been registered *Fusarium* attack. Attack of cereales bad bug (*Eurygaster integriceps*) was noted for all counties, but with value over 1% just in Braila and Tulcea, in comparison with average value of 0,86%. It was also noted the presence only in Ilfov and Teleorman for sprouted grains with value below 0,5%, and harmful or/and toxic with value over 0,05%.

In the second year of study, were not registered bunt grains or ergot for none of the samples analyzed.

In this year, in Southern Plain and Dobrogea was cultivated the following varieties: Bucuresti, prospect, Stil and mixed varieties. In terms of weigh we had different values in function of varieties, the highest value being found at Bucuresti (79,80 gk/hl) an the lowest at Prospect (69,50 gk/hl). Falling number had good and very good values for all varieties (180-250 sec).

Bucuresti variety has registered the highest value in terms of protein content and the lowest at the mixed varieties (9,40%).

Presence of broken and shrivelled rains have been observed with low values only at the mixed varieties (2,68%); the rest of varieties had values over 5%, with maximum at Prospect (10,96%). *Fusarium* attack on triticale grains could be observed just for some varieties, with values below 0,5%; the mixed varieties have not registered *Fusarium* attack.

Attack of cereales bed bug (*Eurygaster integriceps*) was noted at all varieties, but with values over 1% just Prospect and Stil varieties. It was noted also the presence in low percent of sprouted grains just for mixed varieties and Bucuresti (values below 0,5%). On the other hand, presence of harmful and/or toxic grains have been observed with high values, over 0,05%, only for mixed varieties and Bucuresti variety. In this year were not registered.

Data relating to average quality of triticale varieties cultivated in third year of study in Southern Plain and Dobrogea (table 3), show that the highest value of weight was encountered in Tulcea county (70,80 kg/hl) and the lowest in Calarasi county; the average area value was 66,80 kg/hl.

Falling number had small values for all county (below 160 sec). On the other hand, triticale harvest for this year had a protein content between 9,40% (Calarasi) and 13,8% (Tulcea).

Broken and shrivelled grains had high values just in Calarasi ((7,86%), the rest of the county registered values under 5%, with minimum in Teleorman (3,23%); in Tulcea could not be found broken or shrivelled grains, the area average being 3,63%.

**Table 3a. Average quality of Triticale harvest in Southern Plain and Dobrogea -third year of study-**

County/ Variety	Physico-chemical Indicators			
	Weight (kg/hl)	Moister (%)	Falling Number (sec)	Protein content (% s.u.)
County harvest quality				
Brăila	65,20	10,10	70,00	11,90
Calarasi	62,70	11,30	73,00	9,60
Ilfov	66,50	11,70	62,00	10,40
Teleorman	68,80	11,60	88,00	11,60
Tulcea	70,80	12,10	143,00	13,80
<b>Average Mixed varieties</b>	<b>66,80</b>	<b>11,36</b>	<b>87,20</b>	<b>11,28</b>

**Table 3b. Average quality of Triticale harvest in Southern Plain and Dobrogea -third year of study-**

County/ Variety	Impurities						
	Broken and shrivell ed grains (%)	Fusari um grains (%)	Attack od grains bedbug (%)	Spro uted grains (%)	farmfu and/or toxic grains (%)	Bunt grains (%)	Ergot (%)
County harvest quality							
Brăila	3,68	0,55	0,08	0,17	0	0	0
Calara si	7,86	0	0	1,05	0	0	0
Ilfov	3,38	1,93	1,92	6,45	0	0	0
Teleor man	3,23	0	1,43	1,07	0,77	0	0
Tulcea	0	0	0	0	0	0	0
<b>Avera ge Mixed varieti es</b>	<b>3,63</b>	<b>0,62</b>	<b>0,85</b>	<b>1,74</b>	<b>0,19</b>	<b>0</b>	<b>0</b>

*Fusarium* attack on triticale grains it could see just in Braila and Ilfov, the last having value over 1%. Grains bedbug attack was noted (*Eurygaster integriceps*) in some of counties, but with values over 1% just in Ilfov and Teleorman; in Calarasi and Tulcea grains bedbug attack it was not manifested.

It was observed also the presence in high percents of sprouted grains in Calarasi, Ilfov and Teleorman with values over 1%, while in Tulcea not met this attack.

In this year it was noted the presence of harmful and/or toxic grains just in Teleorman, with values over 0,05% and were not registered bunt grains or ergot for none of the triticale samples analyzed from all the counties.

#### 4. CONCLUSIONS

- During the investigated period in Southern Plain and Dobrogea were cultivated mixed varieties and four romanian varieties of triticale (Titan, București, Prospect and Stil);
- Analysing the results of weight, we could observed, in general, values bellow 75 kg/hl;
- By analysing Falling number, resulted very good value in the second year of study (220 sec.), good value in the first year of study (279 sec.) and unsatisfying for the third year of study (87 sec.);
- Protein content had an area average value of 10,9%;
- The triticale harvest in Southern Plain and Dobrogea have content broken and shrivelled grains an evaerage of 5,41%; over 5% broken and shrivelled grains were determinated in Braila (10,14% and 5,68%), Calarași (7,86%), Ilfov (6,01%) and Tulcea (10,96%). On varieties, over 5% was noted for Titan (10,14%), Bucuresti (6,01%), Prospect (10,96%) and Stil (5,68%);
- On the *Fusarium* attack , the average values registered was bellow 0,7%, with difference form a variety to another and one year to other, without affecting the bakery quality;
- The average values of grains bedbug attack in Southern Plain and Dobrogea was under 1%.
- The average values of sprouted grains in Southern Plain and Dobrogea 0,42%;
- Critical values, on harmful and/or toxic grains in triticale harvest were noted in two of the study years (0,1-0,7%);
- Was not found bunt grains and ergot for any variety cultiveted in Southern Plain and Dobrogea, in investigated period.

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