THE INFLUENCE OF WHEAT VARIETY UPON THE CROPS DEPENDING ON WEATHER CONDITION IN DOBROGEA REGION

Mariana POPA[1], **M. AXINTE**[2]

[1] School of Arts and Crafts Crucea - Constanța
e-mail:mariana_p2004@yahoo.com

[2]U.Ş.A.M.V. Iaşi

In a modern agriculture and sustainable the use of nutrients is especially important for obtaining high yields and high capacity planned to wheat. The results worldly obtained prove that the fertilization is one of the main factors in increasing yields. The yields obtained are related and correlated with the quantities of fertilizers used. Fertilization can create the possibility to increase the fund nutrients into forms available to plants, to increase the mobility of different ions and their potential, and soil reaction by changing the ratio between them, the result being an easier nutrition with nutrients from the soil dowry. Long experience plays a crucial role in understanding the complex interactions plant x soil x climate and their effect on production plants. They are essential to understand a series of slow changes that happen in soil by application of fertilizers and other technological links.

***Key words**: production of cariopses, fertilizers, agrofound, genus*

The research performed until now, both in Romania and foreign countries, revealed the primary influence upon the autumn wheat yields which is nitrate [4],[5],[6]. Also, it has been proved that there is a positive interaction between nitrate and phosphorus fertilizers which implies an increasing coefficient from using both types of fertilizers [1], [7].

This interaction can be proved, on one hand by analyzing the increase of crop yields which means to make a comparison between applying fertilizers on the whole and separately and on the other hand by analyzing the coefficients of diminishing equations which can point out a stronger or a weaker interaction in a positive or negative manner.

Concerning the nourishing elements such as nitrate and phosphorus, the most influential on the yield is nitrate. At a dose of 120 kg/ha N and 80 kg/ha P_2O_5 the increase given by nitrate was between 800-1550 kg/ha, at ten experimental stations, whereas the increase given by phosphorus was between 150-350 kg/ha. The crop yield increase ensured by the interaction between nitrate and phosphorus varies from one year to another and from one soil to another [2]. A nitrate and phosphorus fertilizing performance results in major wheat yield increases [3].

MATERIAL AND METHOD

The study applied to nine varieties of Romanian autumn wheat, obtained at IC-DA Fundulea and SC-DA Lovrin, with the purpose of being admitted as the most suitable varieties to be cultivated in extension in Dobrogea region.

The weather conditions in Dobrogea region are almost similar to those in the area of forest brown – reddish soil of Fundulea. This is the reason why more than 85 % of tested soils are from IC-DA Fundulea.

RESULTS AND DISCUSSIONS

As far as the typical reaction to the appliance of fertilizers at different levels concerns (*tab.1*), it can be ascertain that there are obvious genetic differences concerning the capitalization of nitrate and phosphorus among the nine tested soils.

Table 1

The influence of the genus on the caryopses production on wheat in the agricultural year 2004-2005

Variety	Production (kg/ha)	% compared with witness	Difference (kg/ha)	Signification
Alex	6088,8	119,45	991,3	xxx
Boema	5715,6	112,13	618,1	xxx
Delabrad	5517,5	108,24	420,0	xxx
Dor	5376,3	105,47	278,8	xxx
Romulus	5193,8	101,89	96,3	
Fundulea 4	5138,8	100,81	41,3	
Flamura 85	5097,5	100,00	mt	
Rapid	5060,0	99,26	-37,5	
Lovrin 34	4424,4	86,80	-673,1	000

DL 5%= 135,6 kg/ha; DL 1%= 180,1 kg/ha; DL 0,1%= 232,1 kg/ha.

The highest increase of the average wheat yield per hectare, which is significant, had the following varieties: Alex, Boema, Delabrad and Dor. Alex variety registered an increase of 991, 3 kg/ha (19,45 %), Boema variety also registered an increase of 618,1 kg/ha (12,13 %), Delabrad variety registered an increase of 420 kg/ha (8,24 %) and lastly, Dor variety had an increase of 278,8 kg/ha (5,47 %) in comparison to Flamura 85 variety used as standard.

Romulus, Fundulea 4 and Rapid varieties have been registered having negative differences in comparison to Flamura 85 variety, though they had not been ensured statistically.

During the agricultural year 2005-2006 (*tab.2)*, the first place is taken by the same variety group as in the agricultural year 2004-2005, which are Alex, Boema, Delabrad and Dor. The last two places are taken by varieties Rapid and Lovrin 34.

Alex variety, uses the weather conditions at its best, showing an increase of 1015 kg/ha (19, 16 %) in comparison to Flamura 85 variety, which is significant for wheat yield.

Along with Alex variety, three other varieties such as Boema, Delabrad and Dor, register a significant increase at 0,1% probability (Boema, an increase of

594,3 kg/ha; Delabrad, an increase of 391,2 kg/ha and Dor an increase of 258,7 kg/ha). Romulus variety registers an increase of 93, 7 kg/ha, which permits it to be comprised within the experimental error limits.

Other varieties of wheat such as Fundulea 4, Rapid and Lovrin 34 register smaller wheat yields than Flamura 85 variety. Fundulea 4 variety has a yield smaller than Flamura 85, of 28,2 kg/ha. The difference had not been ensured statistically.

Rapid variety is being surpassed by Flamura 85 variety with 152,5 kg/ha, which is a significant negative difference between the two yields, distinctively. In comparison to Flamura 85 variety, Lovrin 34 variety register a smaller yield, 811,9 kg/ha less than the first one. This is also a significant negative difference between the two yields, statistically.

Table 2

The influence of the genus on the caryopses production on the wheat, in the agricultural year 2005-2006

Variety	Production (kg/ha)	% compared with witness	Difference (kg/ha)	Signification
Alex	6313,8	119,16	1015,0	xxx
Boema	5893,1	111,12	594,3	xxx
Delabrad	5690,0	107,38	391,2	xxx
Dor	5557,5	104,88	258,7	xxx
Romulus	5392,5	101,77	93,7	
Flamura 85	5298,8	100,00	mt	
Fundulea 4	5270,6	99,47	-28,2	
Rapid	5146,3	97,12	-152,5	00
Lovrin 34	4486,9	84,68	-811,9	000

DL 5%= 95,2 kg/ha; DL 1%= 126,4 kg/ha; DL 0,1%= 163 kg/ha

During the agricultural year 2006-2007, the unfavorable weather conditions, especially rainfalls, caused the gathering of smaller crop yields. They also caused changing of wheat varieties by the yields point of view (*tab.3*).

In the actual agricultural year, Rapid variety has recorded the highest wheat yields, of 5630 kg/ha, which is different from the yield of 549, 4 kg/ha, significantly. On the second place, is registered Lovrin 34 variety, at a positive difference of 508,8 kg/ha in comparison to the standard variety, which is significant.

The data from *tab.3* along with the data provided by the experiments performed during the other two years resulted in Rapid and Lovrin 34 varieties surpassing Flamura 85 yield, during droughty years.

Romulus variety has been the steadiest of all varieties, being recorded as fifth place, at a yield of 5392,5 kg/ha during the agricultural year 2005-2006 and 4686,4 kg/ha during the period 2006-2007.

Smaller yields than standard Flamura 85 variety are recorded by other varieties as following: Alex, of 1195 kg/ha; Dor, of 962,5 kg/ha; Boema, of 911 kg/ha; Delabrad, of 558,1 kg/ha. These are significant negative differences in yields, statistically.

Romulus variety is surpassed by Flamura 85 variety with 394,3 kg/ha, which is a distinct and significant difference in wheat yields.

Table 3

The influence of the genus on the caryopses production on the wheat, in the agricultural year 2006-2007

Variety	Production (kg/ha)	% compared with witness	Difference (kg/ha)	Signification
Rapid	5630,0	110,81	549,4	xxx
Lovrin 34	5589,4	110,01	508,8	xxx
Flamura 85	5080,6	100,00	mt	
Fundulea 4	5059,4	99,58	-21,2	
Romulus	4686,4	92,24	-394,3	00
Delabrad	4522,5	89,02	-558,1	000
Boema	4168,8	82,05	-911,8	000
Dor	4118,1	81,06	-962,5	000
Alex	3883,1	76,43	-1197,5	000

DL 5%= 292 kg/ha; DL 1%= 387,8 kg/ha; DL 0,1%= 499,9 kg/ha

By analyzing the influence of the wheat variety upon the yields, on the average of three agricultural years, it registers insignificant increases and differences in yields on all varieties from the study in comparison to standard Flamura 85 variety. In other words, Romanian wheat varieties are productive and, on the average, they are not significantly different from each other in yields (*tab.4).*

Table 4

The influence of the genus on the caryopses production on wheat, the average of the years 2004-2007

Variety	Production (kg/ha)	% compared with witness	Difference (kg/ha)	Signification
Alex	5429,2	105,23	270,0	x
Rapid	5277,5	102,29	118,3	
Boema	5260,0	101,95	100,8	
Delabrad	5243,3	101,63	84,1	
Flamura 85	5159,2	100,00	mt	
Fundulea 4	5153,3	99,89	-5,9	
Romulus	5090,9	98,68	-68,3	
Dor	5016,7	97,24	-142,5	
Lovrin 34	4920,9	95,38	-238,3	0

DL 5%= 226,9 kg/ha; DL 1%= 300,7 kg/ha; DL 0,1%= 411,5 kg/ha

Nevertheless, by analyzing the data from the chart, it can be seen that Alex and Rapid varieties have registered yield increases of 270 kg/ha, respectively of 118,3 kg/ha in comparison to Flamura 85 variety. On the other hand, Fundulea 4, Romulus, Dor and Lovrin varieties have registered smaller wheat yields than Flamura 85 variety. Both the increase and decrease of wheat yields had not been ensured statistically.

CONCLUSIONS

1. The wheat is efficiently capitalized the chemical fertilizers, the azotes the nutrient element that determines the biggest production achievements. When applied together – the two elements – azote and phosphor – they con verse grow the action;

2. The azote action on the wheat production is strictly tied to the pluviometric conditions, that can be very different from one year to the other.

3. A very significant production growth under the genus action, can be presented per years as following:

- in the agricultural year 2004-2005, the biggest productions were obtained for the genus: Alex, with 6088,8 kg/ha; Boema, with 5715,6 kg/ha; Delabrad, with 5517,5 kg/ha; Dor, with 5376,3 kg/ha. The smallest productions were obtained for the genus Lovrin 34, with 4424,4 kg/ha;
- in the agricultural year 2005-2006, the biggest productions were obtained for the genus: Alex, with 6313,8 kg/ha; Boema, with 5893,1 kg/ha; Delabrad, with 5690 kg/ha; Dor, with 5557,5 kg/ha; the smallest productions were obtained for the genus Rapid and Lovrin 34, with 5146,3 kg/ha and 4486,9 kg/ha;
- in the agricultural year 2006-2007, the biggest productions were obtained for the genus: Rapid and Lovrin 34, with 5630 kg/ha and 5589,4 kg/ha. The smallest productions were obtained for the genus who in the past obtained the biggest productions: Alex, cu 3883,1 kg/ha; Dor, with 4118,1 kg/ha; Boema, with 4168,8 kg/ha, Delabrad, with 4522,5 kg/ha.
- the average of the years 2004-2007, regarding the production of cariopse/ha, shows us that the biggest production of cariopse of 5429,2 kg/ha, was obtained by the genus Alex, and the smallest production of cariopse of 4920,6 kg7ha, was obtained by the genus Lovrin 34.

4. The influence of the fertilization on the production determined a significant growth on the agro-fund $N_{160}P_{70}$, in all the experimentation years (2004-2007), as following:

- 5433,1 kg/ha, with 269,8 kg/ha more then the unfertilized agro-fund of N_0P_0, in the agricultural year 2004-2005;
- 6710 kg/ha, with 3070 kg/ha more then the unfertilized agro-fund, in the agricultural year 2005-2006;
- 5408,6 kg/ha, with 1310,5 kg/ha more then the unfertilized agro-fund, in the agricultural year 2006-2007.

BIBLIOGRAPHY

1. Hera, Cr. şi colob*.* , 1971 – *Studiul interacţiunii ingrăşămintelor cu azot şi fosfor la graul cultivat în sud-estul ţării.* An. I.C.C.P.T. Fundulea, 37, seria B.
2. Hera, Cr. şi colab**.,** 1976 – Analele I.C.C.P.T., 41, p.169-176.
3. Hera, Cr. şi colab.,1977 – *Unele aspecte ale eficienţei economice a aplicării îngrăşămintelor la grâu şi porumb.* Analele I.C.C.P.T., XLII.
4. Hera, Cr., Mihăilă, V., Crăciun, V., 1984 - *Folosirea îngrăşămintelor pentru realizarea unor producţii mari şi constante.* Cereale şi plante tehnice, nr. 11, p. 8-12.
5. Mihăilă, V., Hera, Cr., Burlacu, Gh., 1980 – *Efectul ingrăşămintelor cu azot şi fosfor asupra producşiei de grâu pe cernoziomurile din sudul României.* Analele IC.C.P.T. Fundulea, XLV: 127-136.
6. Mihăilă, V., Hera, Cr., Crăciun, V., *1992 – Prognoza producţiei de grâu şi porumb, în funcţie de nivelul de fertilizare.* Probl.agrofit.teor. apli., XIV (1-2): 89-104.
7. Toncea, I., 1985 – *Creşterea coeficientului de utilizare a ingraşămintelor cu fosfor.* Prod. Vegetală - Cereale şi plante tehnice.