THE IMPACT OF MINERAL FERTILIZATION UPON SOME MAIZE HYBRIDS CROP FROM ZEMUN POLJE

Florin CRISTA, Florin SALA, Isidora RADULOV, Laura CRISTA

Banat's University of Agricultural Sciences and Veterinary Medicine, Faculty of Agricultural Sciences, Timisoara, Aradului Street, no. 119, RO-300645, Romania,
Corresponding author: florincrista@yahoo.com

Abstract: *The paper showed that fertilizers doses used in order to obtain maximum or economical optimal productions vary between large limits from one year to another based on climatic condition. The crop obtain from studied hybrids varied based on mineral fertilizer doses used on area unit from 10000 kg grains per hectare up to 14000 kg grains per hectare.The fertilizers increase obvious the level and the quality of the crops, if they are used rational. The crop profit value must cover the established expenses of their secure and application and to bring profit. The fertilizer's price increased a lot in the last years, because these are being obtained with high energy consume, that's why is very important the administration process of production in order to obtain maximum efficiency. The decisions concerning the quantities of fertilizer and the application way, depends of the following factors: - The specific consume of nutritive elements of the cultivated plants; - The state of supplying the soil with nutritive solutions indispensable to the plants; - The agricultural system (crop rotation) - The agro-technical measures used; - The remains of the fertilizer applied in the former year; - The moment and the way of application for the current year; - The fertilizer's nature and the economical restrictive factors; The main issue of fertilizers use is to maximize their efficiency per active substance unit. Efficiency implies the ratio of nitrogen in fertilizers which are recuperated from crop boost and, on the other hand, efficiency refers to the quantity of main product which is obtaining from active substance unit. Efficiency can be increased by loses control and removal which appear without doubt on various manners. The quantities of fertilizers entirely used depend of soil wealth in nutritive elements, plant specific consumption, crop rotations, last year's precipitation, and also of the intensity of diseases and pests.*

Key words**:** *hybrid, fertilization, maize, crop*

INTRODUCTION

The western plain area of Romania is a very favorable area for maize crop; this explains the large knowledge of the culture in this area.

MATERIAL AND METHODS

The researches were conducted during the year 2009, in the experimental field from S.D.E. Timisoara, Agro-chemistry Department. 22 hybrids from the Maize Research Institute Zemun Polje were taken under study. Besides those, another two hybrids were studied, those are: Occitan and DK 3511 from Syngenta and Monsanto. Plant density was of 68000 pl/ha.

The fertilization was accomplished using equal doses of fertilizers for all hybrids taken under study. The doses were N_{150} P_{100} K_{100}.

RESULTS AND DISCUSSIONS

The fertility conditions of soil represent an important issue which determines the development of root system. In the case of fertile soils, the roots goes deeper underground and are more ramified than in the less fertile soils types.

The crop results and utilization of macro elements during vegetation period is homogeneous in the case of maize.

Table 1

Synthesis of crop results obtained in the experimental field in 2009

Plot	Hybrid	Name of hybrid	Grain yield kg/ha
1	1	ZP 422	13500
2	2	ZP 423	13635
3	3	ZP 300/7	13125
4	4	ZP 440	12808
5	5	ZP 463	13165
6	6	ZP 461	12834
7	7	ZP 445	12902
8	8	ZP 468	12129
9	9	ZP 548	13334
10	10	ZP 377/7	12911
11	11	ZP 388	13046
12	12	ZP 444/7	12717
13	13	ZP 484/7	12836
14	14	ZP 301/8	12750
15	15	ZP 305/8	12762
16	16	ZP 374/8	13312
17	17	ZP 392/8	13256
18	18	ZP 434/9	13218
19	19	ZP 488	13520
20	20	ZP 499	13311
21	21	ZP 341	13112
22	22	ZP 434	13085
23	23	OCCITAN	11844
24	24	DK3511	12070

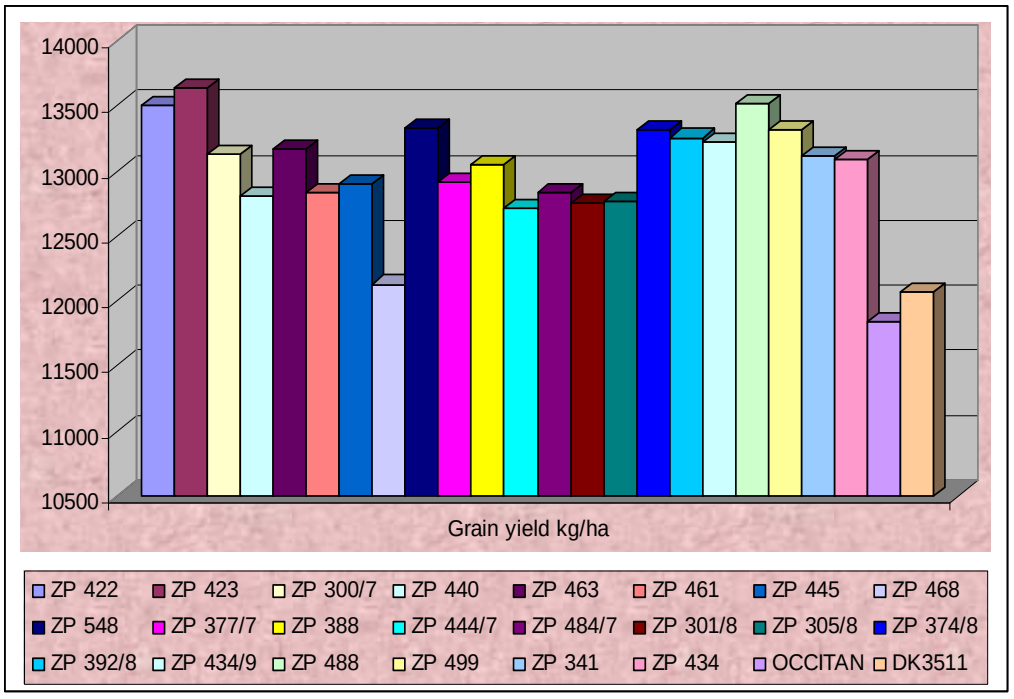

Figure 1: Crop results

Table 2

The impact of nitrogen, phosphorus and potash fertilizers upon crop production

Hybrid	Name of hybrid	Grain yield kg/ha	Increase ratio	
			%	kg/ha
observer	observer	10000	100	-
1	ZP 422	13500	135	3500
2	ZP 423	13635	136.35	3635
3	ZP 300/7	13125	131.25	3125
4	ZP 440	12808	128.08	2808
5	ZP 463	13165	131.65	3165
6	ZP 461	12834	128.34	2834
7	ZP 445	12902	129.02	2902
8	ZP 468	12129	121.29	2129
9	ZP 548	13334	133.34	3334
10	ZP 377/7	12911	129.11	2911
11	ZP 388	13046	130.46	3046
12	ZP 444/7	12717	127.17	2717
13	ZP 484/7	12836	128.36	2836
14	ZP 301/8	12750	127.50	2750
15	ZP 305/8	12762	127.62	2762
16	ZP 374/8	13312	133.12	3312
17	ZP 392/8	13256	132.56	3256
18	ZP 434/9	13218	132.18	3218
19	ZP 488	13520	135.20	3520
20	ZP 499	13311	133.11	3311
21	ZP 341	13112	131.12	3112
22	ZP 434	13085	130.85	3085
23	OCCITAN	11844	118.44	1844
24	DK3511	12070	120.70	2070

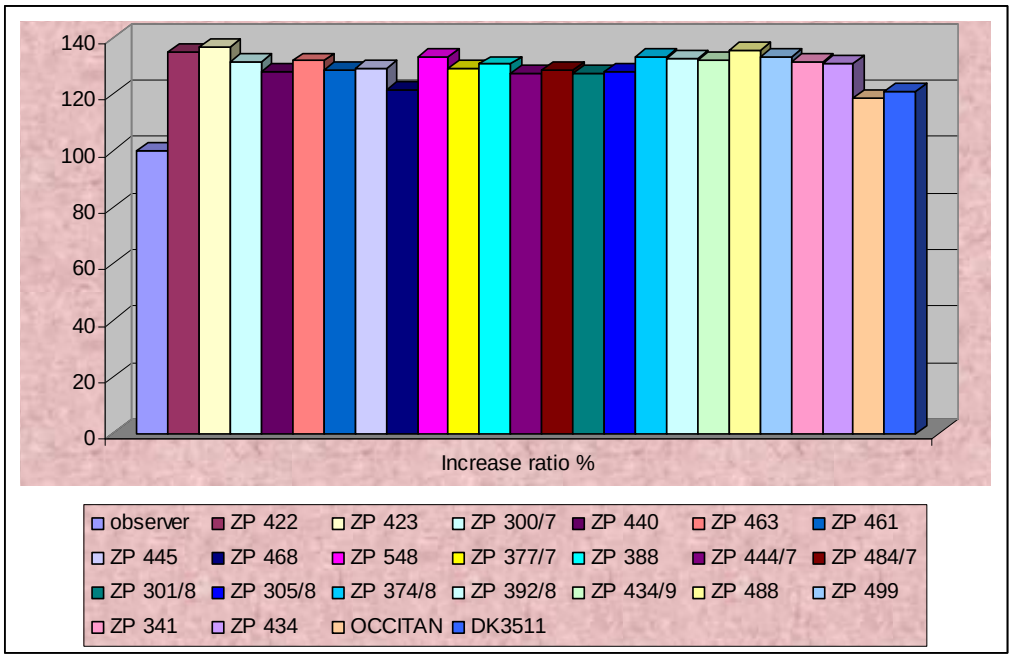

Figure 2: The impact of nitrogen, phosphorus and potash fertilizers upon crop production

The higher value for grain yield was obtain in the case of hybrid ZP 423 (13635 kg/ha), ZP 422 (13500 kg/ha), respectively ZP 488 (13520 kg/ha). The smaller value for grain yield was obtained in the case of hybrid Occitan (11844 kg/ha).

The higher value of increase ratio was 136.35% in the case of ZP 423, the raise was 3635 kg/ha. In generally, the increase ratio values are comparable and over 120 %.

CONCLUSIONS

In the last years, the number of companies which commercialized maize hybrids has seriously increased and thereby, today on the market we can find a lot of hybrids. Many of these do not respond reasonable from the economic point of view.

The hybrids taken under study in the pedo-climatic condition from SDE Timisoara, assured a grain yield over 11000 kg/ha.

The crop quality and quantity depends not only of the choice of an optimal ratio between the elements in soil and of the fertilizers doses quantity. Up to a certain point, the yield increase with the increase of the doses, behind this point any raise of the dose has no effect or a negative one.

BIBLIOGRAPHY

1. BUDOI GH. Tratat de agrochimie, Principii de fertilitatea solului si nutritia plantelor, Ed. Sylvi, Bucuresti, 2004
2. CRISTA F, RADULOV I, SALA F. Agrochimie aplicatii practice, Ed. Agroprint
3. CRISTA F, GOIAN M. Imaginea unei agriculturi durabile, fertilizarea solului in regim controlat, Lurari stiintifice, Facultatea de Agricultura, XXXVIII, Ed. Agroprint Timisoara
4. MUNTEANU L, BORCEANU I, AXINTE M, ROMAN V. - Fitotehnie, Ed. Ion Ionescu de la brad, Iasi
5. SALA F. Agrochimie, Ed. Eurobit, Timisoara, 2007
6. SMULEAC A, GOIAN M. Fertilizarea minerala si organica la grau si porumb, Ed. Mirton, Timisoara