

CORRELATIONS BETWEEN SOME PHYSIOLOGICAL PROCESSES OF MAIZE HYBRIDS WITH MINERVA AND DANUBIU INFLUENCE ON YIELD AND QUALITY OF GRAIN

RĂDULESCU DIANA¹, TĂNASIE ȘTEFANIA ELIZA², DUMITRU FLORIN³

^{1,2} *University of Agricultural Sciences and Veterinary Medicine, Faculty of Management, Economical Engineering in Agriculture and Rural Development, Slatina Branch, Romania, Phone/Fax: 00 40 728 0009 52, Email: radulescudiana15@gmail.com*

³ *Regional general direction of public finances Craiova. AJFP OLT, Slatina, str. Arch, No. 2*

Keywords: hybrid, irrigation, fertilizer, fotosintesis.

ABSTRACT

The paper presents originality because in Oltenia, in general, were not conducted studies of physiological processes determined in different environmental conditions or water deficit years and years normal in terms of climate, the maize crop. There were two hybrids in the study Danubiu and Minerva, where they were executed correlations showing the indispensable link between the conduct physiological processes during vegetation and their influence on the quality and quantity of grain corn harvest.

Experiments were located in Olt, respectively in common Dobroteasa taking soil samples. The combined influence of hybrid technology and culture (applying proper irrigation and fertilizer dosing) causes changes in key physiological processes that can lead to optimization of production technologies in order to obtain maximum dose of fertilizer applied rationally.

Hybrids and Danubiu Minerva in the study were grown under the same conditions behaved differently in terms of technology, culture, values recorded in being physiologically different each using the right level of fertilizer.

They studied the effects of simultaneous application of irrigation with varying doses of fertilizers.

INTRODUCTION

In our country maize occupies an area of considerable arable land one of the main cereal crops due to its importance in food, animal feed and industry. Agriculture is a major consumer of water, which uses about 70% of prevalence made on freshwater resources. [Botzan M.,1966]. As we know, the best results on the production of maize was obtained when applied as irrigation maintenance and management of chemical and organic fertilizers.

Filling moisture deficit through irrigation, as implied Botzan M., 1962 it is the method of controlled soil supply additional water to those received under natural conditions.

The same author, in 1979, show that irrigation in a frame agro suitable qualifying energy among the most productive human intervention, and referring to the fact that water requirements are rising, the author believes that it can act with much more on the line lifting irrigation water use efficiency.

Irrigation, as determined Raut C., et al.,1986, ensured where were applied correctly in complex with other necessary measures, significant increases in the productive capacity of the soil and especially on farming.

MATERIAL AND METHOD

To this end, we intend to study the interaction of hybrid crop irrigated and non-irrigated, but the effect of the applied fertilizers (NP) in maize and establish correlations between physiological processes that occur and hence their influence on the quality and production quantity of maize. Experiments were located since 2010, taking soil samples and pursuing the climate data. It has also established culture prior to 2011, namely wheat, followed in 2012, to make analyzes physiological and biochemical and establish correlations between the quantity and quality of production.

Experiences in the field have resulted in:

- location and achievement in the field experimental device;
- tracking vegetation walking maize hybrids studied correlated with doses of fertilizers used in irrigated and non-irrigated;
- recording obtained yields and quality of the effect of different doses of chemical fertilizer application and irrigation system in using culture;
- processing of data and drawing conclusions that can be drawn from experiences.

Polifactorial experience is placed in the field after the subdivided parcels method.

Experience has three factors:

I. factor A – hybrid maize with two graduations:

- A₁ - hybrid Minerva
- A₂ – hybrid Danubiu

II. Factor B – irrigation system:

- B₁ - irrigated
- B₂ - Watering

III. Factor C – fertilizer application rates:

- C₁ - N₀P₀
- C₂ - N₆₀P₄₀
- C₃ - N₈₀P₆₀
- C₄ - N₁₀₀P₈₀
- C₅ - N₁₂₀P₁₀₀

By combining the three factors resulted graduations 20 variants arranged in four repetitions after subdivided parcels method tiered row. The area is 22.4 m² sown embodiment, having a density of 50.000 plants per hectare.

RESULTS AND DISCUSSIONS

There have been made some physiological tests in the leaves of maize hybrids studied to establish correlations under the influence of doses of nitrogen and phosphorus.

Table 1

The influence of the dose of nitrogen and phosphorus to the physiological processes in hybrid corn Minerva June 20. 2012

Alternative	Photosynthesis	Respiration	Absorption capacity	Suction force
	mg CO/dm ²	mg CO ² /100 g m.v.	g ap/h/dm ²	atm
Non-irrigated				
N ₀ P ₀	234	186.5	5.92	4.3
N ₆₀ P ₄₀	240.5	189.9	5.94	4.6
N ₈₀ P ₆₀	258.3	210.3	5.87	4.18

N ₁₀₀ P ₈₀	263.4	215.6	6.15	4.14
N ₁₂₀ P ₁₀₀	256.8	210.8	6.04	4.21
Irrigated				
N ₀ P ₀	243.7	190.4	6.11	4.9
N ₆₀ P ₄₀	268.3	193.8	6.15	4.12
N ₈₀ P ₆₀	271.5	209.7	6.27	4.22
N ₁₀₀ P ₈₀	274.9	218.8	6.2	4.26
N ₁₂₀ P ₁₀₀	273.5	226.4	6.24	4.21

Table 2

The influence of the dose of nitrogen and phosphorus to the physiological processes in hybrid corn Danubiu June 20. 2012

Version	Photosynthesis	Respiration	Absorption capacity	Sucion force
	mg CO/dm ²	mg CO ² /100 g m.v.	g ap/h/dm ²	atm
Non-irrigated				
N ₀ P ₀	221.3	169.5	5.31	4.17
N ₆₀ P ₄₀	226.4	170.4	5.34	4.21
N ₈₀ P ₆₀	227.8	175.3	5.35	4.3
N ₁₀₀ P ₈₀	225.8	171.6	5.3	4.31
N ₁₂₀ P ₁₀₀	225.9	172.5	5.32	4.29
Irrigated				
N ₀ P ₀	230.2	175.4	5.1	4.3
N ₆₀ P ₄₀	234.5	179.3	5.26	4.48
N ₈₀ P ₆₀	236.5	180.2	5.3	4.49
N ₁₀₀ P ₈₀	231.3	181.1	5.2	4.5
N ₁₂₀ P ₁₀₀	231.6	180	5.18	4.47

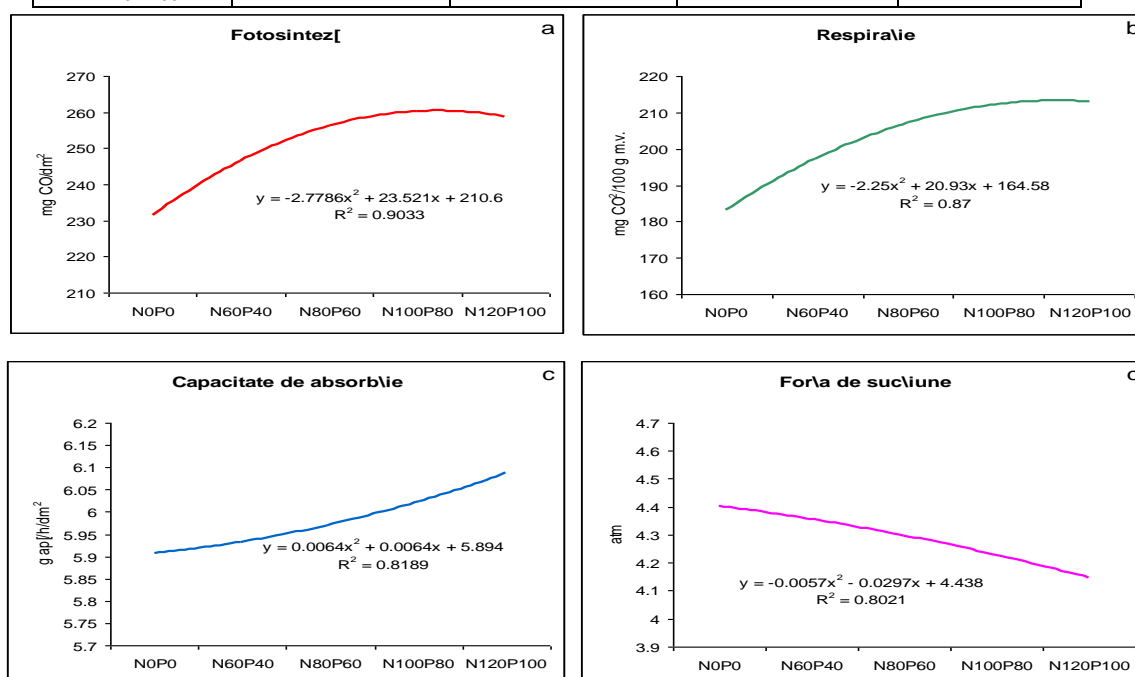


Chart 1. The relationship between the applied doses of nitrogen and phosphorus in the system and some physiological processes irrigated maize hybrid Minerva. 20 June 2012

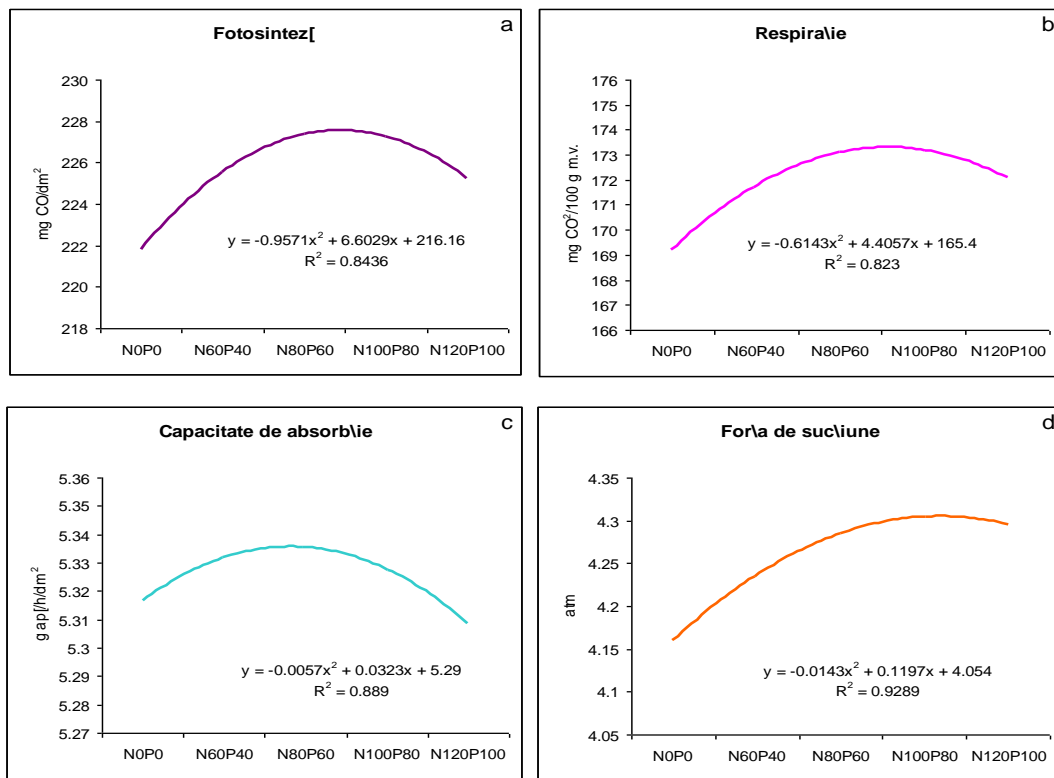


Chart 2. The relationship between the applied doses of nitrogen and phosphorus in the system and some physiological processes irrigated maize hybrid Danubiu. 20 June 2012

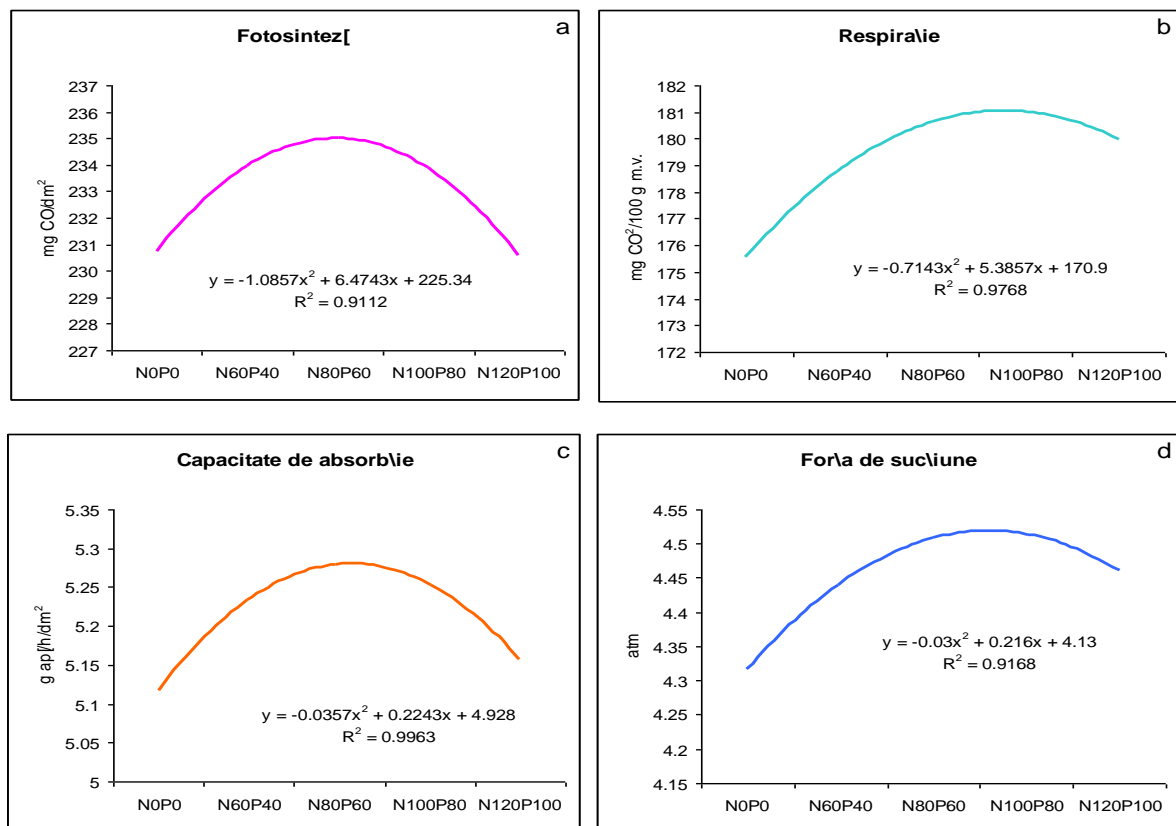


Chart 3. The relationship between the applied doses of nitrogen and phosphorus in the system and some physiological processes irrigated maize hybrid Danubiu. 20 June 2012

CONCLUSIONS

- ✓ There is an increase by almost 20% compared to control the intensity of photosynthesis variant irrigated versus non-irrigated witness for the two hybrids.
- ✓ Regarding the process of respiration, CO₂ expressed in mg / 100 g m.v., when there is insignificant June 20 both irrigated and non-irrigated to the amount of carbon dioxide removed the variants studied not significant. The regression coefficient is statistically assured, however, and the curve reaches maximum system N₁₂₀P₁₀₀ irrigated and irrigated, tint linear regression line is for the two hybrids.
- ✓ Absorption capacity, determined in g / H₂O, shows minimum to variants irrigated except variant N₁₀₀P₈₀, which recorded the highest value and in terms of variants irrigated, the difference is clearly significant being statistically with increasing content in fertilizers.
- ✓ The force of suction, expressed in atmospheres shows a rising trend in the first variants non-irrigated and then begin to decline at variants that applied irrigation, power suction The most obvious was recorded in witness irrigated influence fertilizers without affecting the force of suction.
- ✓ The regression coefficient is statistically assured and downward pace has non-irrigated system where a dash upward for irrigation and fertilizer application of maximum doses.

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