

RESEARCH REGARDING THE BEHAVIOUR OF SOME ROMANIAN AND FOREIGN MAIZE HYBRIDS UNDER THE STRESS CONDITIONS OF THE TECUCI PLAIN

CERCETĂRI PRIVIND COMPORTAREA UNOR HIBRIZI DE PORUMB AUTOHTONI ȘI STRĂINI ÎN CONDIȚII DE STRES ÎN CÎMPIA TECUCIULUI

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Abstract: The researches were performed in Tecuci Plain during three years (2003-2005) in order to determine the level of watering norm diminution without to affect significantly the yield and the choosing of the best hybrids, which under limited water supplying lead to the obtainment of high and stable yields. The results showed that, by the watering norm diminution with 25% vs. pedological one, the irrigation water cost is reduced with 380-400 RON/ha. The recommended hybrids for the irrigation under stress are PR35P12 and PR3824.

Rezumat: Cercetările s-au efectuat în Cîmpia Tecuciului timp de trei ani (2003-2005), avînd ca scop determinarea nivelului pînă la care se poate reduce norma de udare fără a afecta semnificativ producția și depistarea celor mai buni hibrizi care în condiții de subasigurare cu apă să determine obținerea de producții ridicate și stabile. Rezultatele obținute au arătat, că prin reducerea normei de udare cu 25% față de norma pedologică se realizează economii cu apa de irigație de 380-400 Ron/ha. Hibrizii recomandați la irigarea în condiții de stres sunt PR35P12 și PR38A24.

Key words: irrigation, stress, watering norm, limited water supplying, hybrid, yield cost, benefit

Cuvinte cheie: irigare, stres, normă de udare, subasigurare cu apă, hibrid, cost de producție, profit

INTRODUCTION

In order to establish the limited water supplying on maize growth and development, a bifactorial experiment was performed during 2003-2005. The land was uniform as fertility and micro-relief and the soil was cambic chernozem.

Six foreign hybrids and Romanian one were used.

MATERIAL AND METHOD

The experiments during 2003-2004 and 2005 were located after sub-divided plots with the following factors:

A factor – irrigation with graduations:

A₁ – non-irrigated

A₂ – irrigated with P min 50% of active moisture interval with pedological norm of 850 m³/ha;

A₃ – irrigated with watering norm of 75% from pedological one, respectively 640 m³/ha.

B factor – hybrid

B₁ – Florencia

B₂ – PR35P12

B₃ – PR36R10

B₄ – PR37M34
 B₅ – PR38A24
 B₆ – PR39D81
 B₇ – Turda 200

RESULTS AND DISCUSSION

The obtained results were processed for each experimental year and during whole period. The climatic features of those three years of experimentation were favourable to research. The years 2003 and 2004 were climatically normal and 2005 was excessively rainy year. The result synthesis during 2003-2005 is presented in table and figure 1, where one can ascertain that the highest yields were achieved by hybrids PR35P12 (116,2 q/ha) and PR38A24 (109,6 q/ha). The yield gain of hybrid PR35P12 vs. check Florencia is 11.7 q/ha (very significant) and of hybrid PR38A24 is 5.1 q/ha (significant).

Table 1

The result synthesis during 2003-2005

Variant	Florencia	PR35P12	PR36R10	PR37M34	PR38A24	PR39D81	Turda200	Average
	b1	b2	b3	b4	b5	b6	b7	
a1- non- irrigated	92.2	102.3	94.8	91.3	92.8	46.8	59.8	82.9
a2 = irrigated at Pmin 50% of A.M.I. with m=850 m ³	118.6	128.5	119.6	123.5	125.2	63.6	78.8	108.3
a3 - irrigated at Pmin 50% of A.M.I. with m=640 m ³	102.6	117.7	104.2	108.1	110.8	54.3	73.4	95.9
Average	104.5	116.2	106.2	107.6	109.6	54.9	70.7	-

LSD value	DI 5%	DI 1%	DI 0.1%
For comparison between irrigation variants	4.67	7.32	14.13
For comparison between hybrids	2.9	3.69	5.08
For comparison between hybrids under the same irrigation variants	4.62	6.40	8.76
For comparison between irrigation variants at the same hybrid)	5.96	8.91	14.92

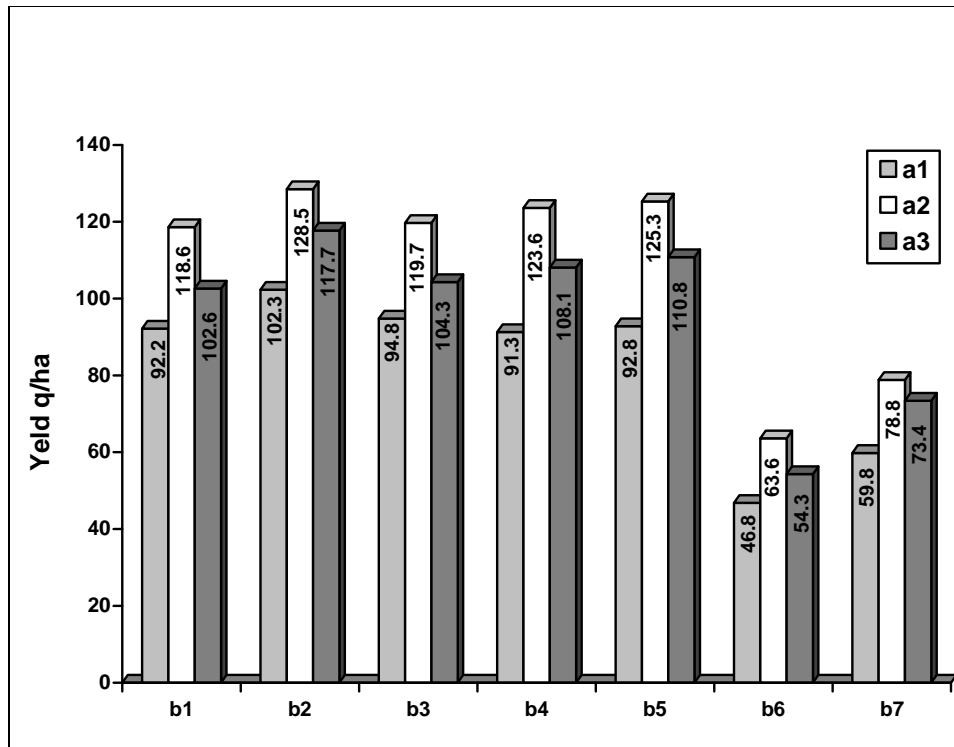


Fig. 1 The result synthesis during 2003-2005

Regarding the limited water supplying, the yield obtained by watering norm diminution with 25% vs. pedological one was 95.9 q/ha, with a yield diminution of 12.4 q/ha, about 13%.

Having in view the thrifths of irrigation water (25%), the yield diminution of 12.4 q/ha (13%) is acceptable.

Regarding the economical efficiency (Table 2), one can ascertain that the gross benefit in variant irrigated at the optimum level, ranged between 210.2 and 335.1 EUR/ha, depending on the year climatic conditions and in variant with limited water supplying between 224.2 and 332.1 EUR/ha.

This confirms the obtained results and emphasizes the possibility to diminish the watering norm with 25% vs. pedological one of 850 m³/ha.

CONCLUSIONS

Researches performed in Tecuci Plain during long-term experiments allowed the following conclusions and recommendations:

- The moisture requirements of maize cultivated for kernels are ensured by the application of 2-5 waterings depending on the climatic conditions (two waterings in rainy year and 5 ones in normal or droughty year).
- The application of an optimum irrigation regime means a pedological watering

norm of 850 m³/ha when the soil moisture is at the level of Pmin 50% active moisture interval.

- The limited water supplying, respectively the application of principle “more yield with less” under conditions of market economy is possible if this diminution of pedological norm is about 25%.
- Under limited water supplying, the irrigation regime elements are: watering norm = 640 m³/ha; watering number = 2-5 depending on climatic conditions; irrigation norm = 1280-3200 m³/ha.
- By the limited water supplying, a diminution of irrigation norm with 420-1050 m³/ha is achieved, with good effects on irrigation water expenses, which at irrigation system Cosmesti-Nicoresti-Tecuci are of 800 RON/1000 m³.
- The hybrids recommended for irrigated crop in Tecuci area are PR35P12 and PR38A24, with an yield of 110-115 q/ha under limited water supplying.
- The gross benefit obtained by variants with limited water supplying exceeds the values obtained in variants irrigated at optimum level; the economical results underline the yield results and emphasize the possibility to diminish the watering norm with 25% vs. pedological one of 850 m³/ha.

LITERATURE

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