PRECOCITY INDEX FOR MAIZE - DIFFERENCES BETWEEN HYBRIDS

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Abstract
In this work we analyzed ten corn hybrids in terms of their precocity index expressed with early or bloom. This index distinguishing between maize hybrids, useful levels of each hybrid in accumulated other party actually making the difference between them.
The research was based on analysis of thermal requirements of the ten hybrids experienced for sunrise period completion 50% - flowering, which is, in fact, the index of precocity.
Research was conducted at the Center for Testing Varieties Targoviste over three years and the biological material analyzed was ten Romanian maize hybrids.
They were: Olt, Olimp, Campion, Milcov Fundulea 376 – create at the Institute for Research Fundulea and Turda 165, Turda Mold 188, Turda Super, Turda 201 and Turda Favorite - create the Research Station Turda.
Are presented the results of research on years of experimentation, each hybrid in part, and media group to which they do part. Then are presented the average values obtained on the three years of experimentation in terms of precocity index. The value of the precocity index in the first year of research was 716.5 ^{0}C , for the group of hybrids Fundulea and 43.8^{0}C lower in Turda hybrids. In the second year of analysis the values of precocity index were ranged from 551.7 ^{0}C at Turda hybrids to 667.0^0 C at the Fundulea hybrids. In the third years, hybrids Fundulea required for emergence 50% - flowering a sum of effective temperature 704.4 ^{0}C and hybrids Turda 615.8 ^{0}C. Average for the three years of research into the value of the early hybrids was 695.9^0 C at Fundulea group and 613.3^0 C at the hybrids Turda, the difference between the two groups were analyzed being 82.6^0 C.

Keywords: maize, hybrids, precocity index, differences

1. INTRODUCTION

The importance for Romania, corn remains a cereal that always requires investigation, the idea that any experimental results, wherever they get in our country contributes, on the one hand, a better understanding of the biology of this plant, and secondly to increase yield.
The precocity index or flowering represent the sum of useful thermal units ("effective") during emergence 50% - silk emergence [2]. Temperature as a key element of maize precocity recorded from biological threshold of 10 ^{0}C, biological threshold accepted by all researchers [1].

2. MATERIAL AND METHOD

Were taken in ten experimental hybrids of maize, five simple, create at Fundulea Institute, all of indented convariety and five trilinal hybrids create at Turda all of the aorista convariety.
Researches have been set up at the Experimental Center for Testing Cultivars from Targoviste. Experiences have been established as randomized blocs with ten variants of four repetitions.
To calculate the amount of useful heat units we used the standard method with data from Meteorological Station Targoviste.

$$\sum UTU = \frac{T + t}{2} - 10, \text{ where}$$

T = daily maximum and minimum temperature (^{0}C)
ΣUTU = sum of thermal units or degrees relevant to daily growth (Growing degree day)
If (T + t) / 2 <10 → ΣUTU = 0

3. RESULTS AND DISCUSSION

The results obtained in the three years of experiments are presented in the next tables.

Table1. Precocity index expressed by the sum of useful thermal units of corn hybrids experienced

Hybrids	Σ t >10^{0}C		
	Year I	Year II	Year III
Olt	718,7	647,2	705,2
Olimp	718,7	666,8	719,0
Campion	718,7	666,8	709,2
Milcov	696,9	666,8	679,4
Fundulea 376	729,6	687,4	709,2
Media group	**716,5**	**667,0**	**704,4**
Turda 165	650,3	539,4	611,4
Turda Mold 188	661,2	543,8	646,6
Turda Super	684,5	539,4	592,0
Turda 201	672,1	581,4	617,8
Turda Favorit	695,4	554,6	611,4
Media group	**672,7**	**551,7**	**615,8**

Regarding the precocity index which clearly distinguishes hybrids between them in terms of units of useful heat and the group of precocity, he issued the first year of analysis range from 696.90C and 729.6^{0}C at Fundulea group hybrids, the average being 716.5^{0}C.

Hybrids Olt, Olimp and Campion required for completion sunrise period 50% - a flowering equal amount of heat of 718.7^{0}C and hybrid F 376 an amount of heat to 729.6^{0}C.

Index of precocity in Turda hybrids are at levels between 650.3 and 695.4^{0}C, average of the group being 672.7^{0}C. Differences between Turda hybrids in this first year of research are between 10.9 and 45.1^0 C.

Comparing groups of precocity among themselves as average values observed differences in the amount of useful heat units accumulated during the emergence 50% - silk. These differences are embodied in a number of relevant degrees in addition to hybrids Fundulea over hybrids Turda with 43.8^{0}C.

From the data presented in Table 1 it is noted that precocity index in the second year of research is almost equal to all Fundulea hybrids. To the hybrids Olimp, Campion, Milcov precocity index have the same value 666.8 ^{0}C; hybrids Olt have less of an offense in 19.6^{0}C and F 376 hybrid have a positive deviation of 20.6^{0}C compared to the three hybrids listed.

Under these conditions, the average of precocity index for the hybrids of group Fundulea is 667,0^{0}C ± 20^{0}C.

Analyzing the amount of useful thermal units from emergence to flowering and hybrids Turda in second year of analysis it is found and here the very close values with each index of precocity. The average group is 551.7^{0}C within 539.4^{0}C at Turda165 and Turda Super and 554.6^{0}C at Turda Favorite hybrid.

Comparing the average values of groups of hybrids tested have observed that Fundulea hybrids have the value of the precocity index from 667.0^{0}C and the Turda hybrids of 551.7^0 C with a deviation 115.3^{0}C. The difference of 115.3^{0}C (amount of useful thermal units) do differentiate between the two groups of hybrids tested in terms of seasons.

In the third year of research is noted that the effective temperature sum from emergence 50% - flower has different values in hybrids Fundulea, it fits between 679.4 and 719.0^{0}C, the average of group being 704.4^{0}C.

Precocity index values recorded in Turda group appear more homogeneous in hybrids experienced; they are between 592.0 and 617.8^{0}C, average of group being 615.8^{0}C.

Turda Favorite and Turda165 hybrids had the same value of precocity index (611.4^{0}C).
Differences between the two precocity groups in this year in terms of flowering index are 86.6^0 C useful amount for hybrids Fundulea.

Table 2: Precocity index of analyzed maize hybrids expressed by the sum of useful thermal units (average of three years of research)

Hybrids	Precocity index medium values
Olt	690,3
Olimp	701,5
Campion	698,2
Milcov	681,0
Fundulea 376	708,7
Media group	**695,9**
Turda 165	600,3
Turda Mold 188	617,2
Turda Super	605,3
Turda 201	623,7
Turda Favorit	620,4
Media group	**613,3**

From Table 2 it is noted that the amount of heat needed east browsing period sunrise 50% - flowering (precocity index) varies from one hybrid to another, in groups of precocity, and from one group to another. Thus, for the period from sunrise - flowered Milcov hybrid requires 681.0^{0}C the amount of useful degrees, while the hybrid F 376 needs to browse the same period by 27.7^{0}C more than the sum of useful degrees.
Similarly, hybrid Turda 165 needs for completion period sunrise - flourished a quantity of heat 600.3^{0}C, while the hybrid Turda 201 requires 623.7^{0}C.
The difference between groups of hybrids analyzed is 82.6^{0}C for hybrids Fundulea group, they in need of a larger amount of heat for periods crossing east - bloom than hybrids Turda group analyzed.

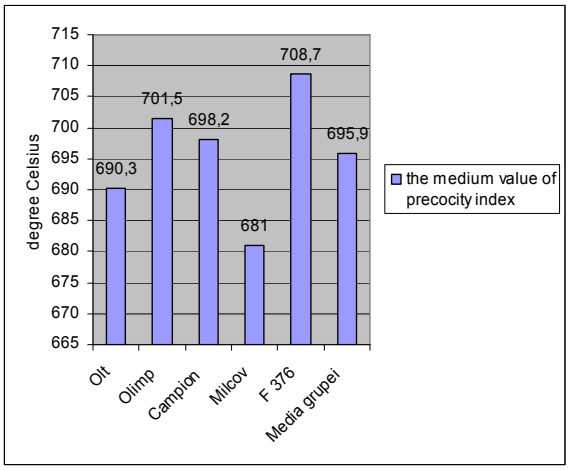

Figure 1 – Precocity index at Fundulea group hybrids (medium value)

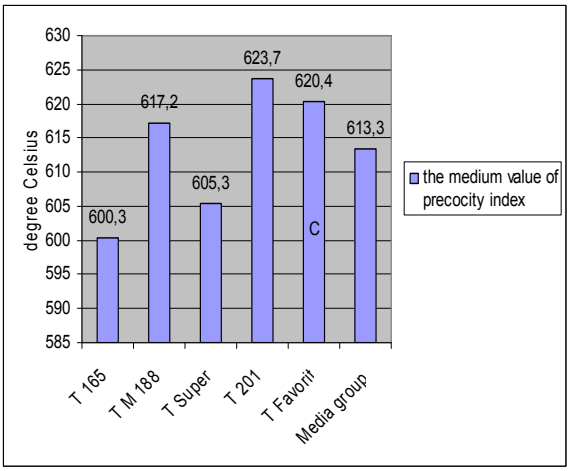

Figure 2 - Precocity index at Turda group hybrids (medium value)

4. CONCLUSIONS

Growths of maize plants and vegetation during the phase sunrise - bloom are closely related to the heat factor [3].

An amount of useful temperature for browsing the period sunrise - gray is between 600.3 and 708.7^{0}C (depending on the hybrid).

The difference between the two groups of hybrids analyzed in terms of average index of precocity in the three years of experience was 82.6^{0}C in Fundulea group in addition to the Turda group. This difference indicates that the relevant degrees are Turda earliest hybrids than hybrids Fundulea regarding flourishing.

Useful degrees more or less make the difference between hybrids in terms of their precocity.

In terms of thermal analysis the experimented hybrids fall in terms of the vegetation period in group of medium hybrids (semi-later - Fundulea and semi-earlier - hybrids Turda).

5. REFERENCES

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