THE STERILE PLANTS PERCENTAGE VARIATION ACCORDING TO THE HYBRID, FERTILIZATION, TO THE CULTIVATION DENSITIES AND TO THE MAIZE CORP TYPE

VARIAȚIA PROCENTULUI DE PLANTE STERILE ÎN FUNCȚIE DE HIBRID, FERTILIZARE, DENSITATE DE CULTIVARE ŞI TIPUL DE CULTURĂ LA PORUMB

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Abstract: *The sterile plant percentage depends on the type of hybrid, on the pedoclimatic conditions and on the used technology. Among the most influent technological chains are the fertilization, the plant density and, last but not least, the type of crop – irrigated or non-irrigated.*

This paper presents the sterile plant percentage variation during a trifactorial experiment in which the A-factor was the agrifond (N_{100}, N_{200} and N_{300} on a constant base of $P_{100}K_{100}$), the cultivation density (60.000; 70.000 and 80.000 plants/ha) and the cultivated hybrids, which for Romania were Andreea and Faur, and for Greece Lazaro and Varenne. În Romania, in non-irrigated cropping system, the sterile plant variation was of between 2 and 11,6%, and in Greece, in irrigated cropping system, of between 2 and 8%.

Rezumat: *Procentul de plante sterile este dependent atât de tipul hibridului, condițiile pedoclimatice şi tehnologia aplicată. Dintre verigile tehnologice cu mare influență sunt fertilizarea, densitatea lanului şi desigur tipul de cultură – irigat sau neirigat.*

În lucrare se prezintă variația procentului de plante sterile într-o experiență trifactorială în care factorul A a fost agrofondul (N_{100}, N_{200} şi N_{300} pe fond constant de $P_{100}K_{100}$), densitatea de cultivare (60.000; 70.000 şi 80.000 plante/ha) şi hibrizii cultivați, care în România au fost Andreea şi Faur, iar în Grecia au fost Lazaro şi Varenne. În România, în cultură neirigată, variația plantelor sterile a fost între 2 şi 11,6%, iar în Grecia, în cultură irigată între 2 şi 8%.

Key words: *maize, sterile plants, agrifond, hybrid density.*
Cuvinte cheie: *porumb, plante sterile,agrofond, densitate hibrid*

INTRODUCTION

The reduction of the sterile plant percentage in the maize fields is an important goal, as it directly influences the yield level.

The results obtained in this field show that this percentage differs from hybrid to hybrid, being influenced by the fertilization level and by the plant density and depending on the cropping system, that is irrigated or non-irrigated cropping system.

MATERIAL AND METHODS

The researches were done for a number of four maize hybrids, Lazaro and Varenne in Greece and Andreea and Faur in Romania.

These hybrids have different vegetation periods and different morphophysiological characteristics. The climatic conditions in Greece make necessary the maize cultivation in irrigated cropping system.

In Romania, in Câmpia Timişului (Timiş Plain) the cultivation can be economically efficient done in non-irrigated cropping system.

The technological chains determined are the level of fertilization and the plant density.

The researches were carried out on an alluvial soil in Greece and on chernozem in Romania.

RESULTS AND DISCUSSIONS

In fig. 1 and 2 are presented the results of the observations obtained on the experimental field in Greece.

So, figure 1 shows that, according to the fertilization and to the plant density, the percentage of sterile plants varied between 2 and 8% for the variety Lazaro.

There can be noticed, that the lowest percentage of sterile plants for all fertilization levels was registered for the variant having the lowest plant density and that it grew together with the density from an average of 2% to an average of 6% for all three fertilization levels. The fertilization contributed to the decrease of the sterile plant percentage.

The results obtained for the Varenne variety are presented in figure 2.

For the researched field of activity the value amplitude was of between 3% and 9%.

The lowest value was registered for the variant having a density of 60.000 plants/ha for this hybrid too.

The percentage of sterile plants increased together with the density, the values being of between 9% for the agrifond $N_{100}P_{100}K_{100}$ and 5% in the variant fertilized with $N_{300}P_{100}K_{100}$.

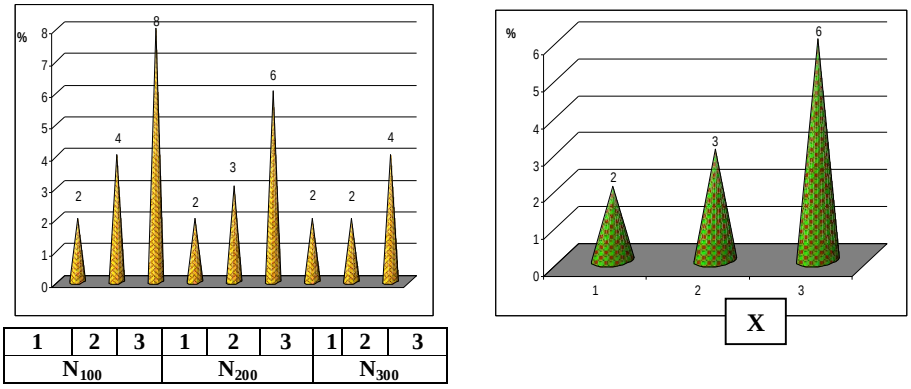

Figure 1. The sterile plant percentage determined for the Lazaro hybrid

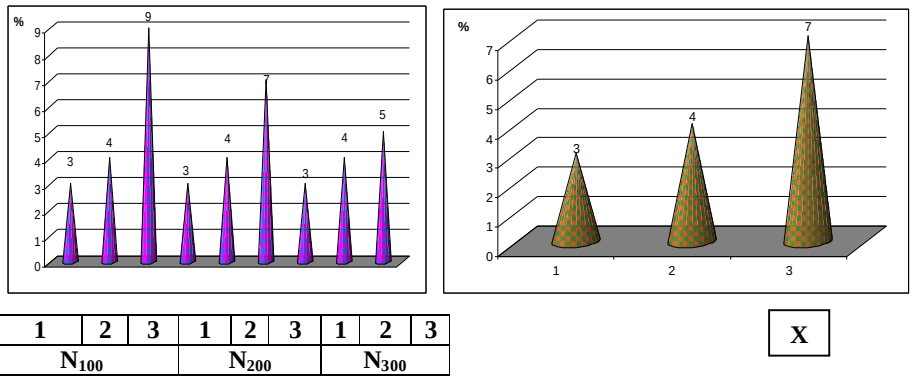

Figure 2. The sterile plant percentage determined for the Varenne hybrid

In the figures 3 and 4 are presented the results obtained on the experimental field in Romania, for a non-irrigated cropping system.

In the case of Andreea hybrid the value amplitude was of between 3% and 8%.

The most reduced average percentage for the three agrifonds was of 2,8% and was registered for the variant having the lowest plant density.

It increased to 7% for the variant with the highest plant density.

For the Faur hybrid, which has a longer vegetation period as Andreea hybrid, the average sterile plant percentage for the three fertilization levels was of 6,5% for a plant density of 60.000 plants/ha, it increased to 8,6% in the variant with 70.000 plants/ha and to 11,6% in the variant cultivated at a density of 80.000 plants/ha.

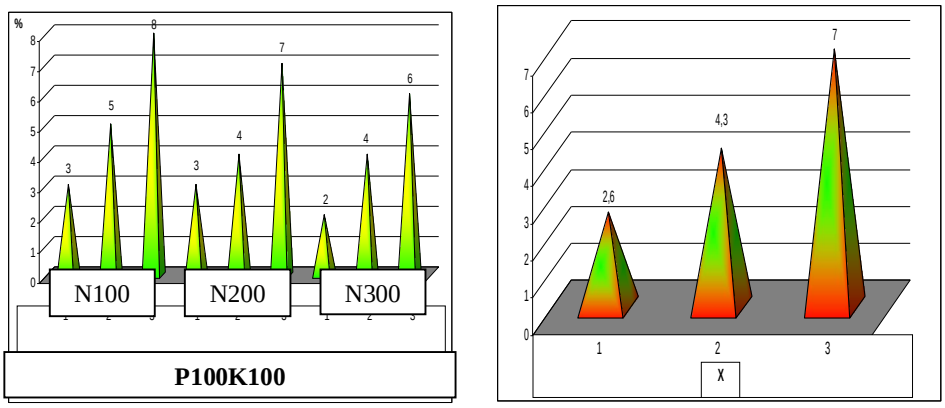

Figure 3. The sterile plant percentage determined for the Andreea hybrid

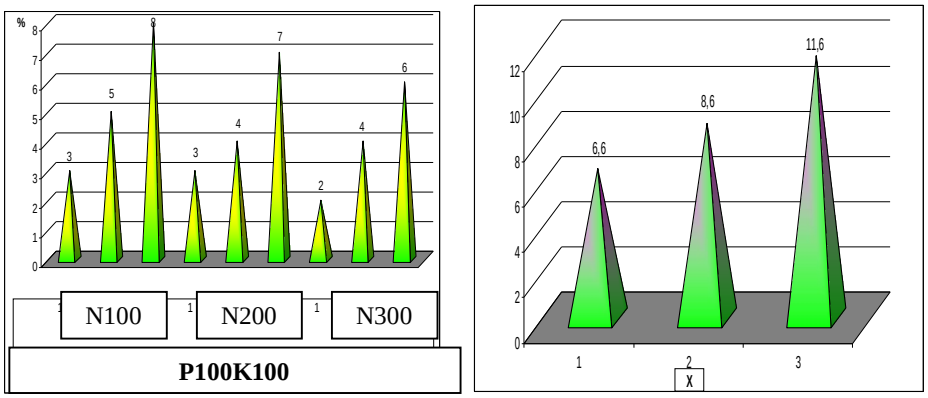

Figure 4. The sterile plant percentage determined for the Faur hybrid

CONCLUSIONS

1. The sterile plant percentage for all experimented hybrids increased as the plant density increased, the lowest values being obtained for the variant in which the plant density was of 60.000 plants/ha, and the highest values for the variant in which the plant density was of 80.000 plants/ha.

2. The sterile plants percentage was influenced by the fertilization, the lowest values being registered for the variant in which the highest fertilizer doses were applied.

3. At the maize hybrids with a longer vegetation period the percentage of sterile plants was higher than at the hybrids with a shorter vegetation period.

BIBLIOGRAPHY

1. BÎLTEANU, GH., SALONTAI, AL., VASILICA, C., BÎRNAURE, V., BORCEAN, I., 1991 - *Fitotehnie*, Ed. Didactică şi Pedagogică, Bucureşti,135-139.
2. DAVID, GH., TABĂRĂ, V., ŞUVEŢI, SIMONA, POP, GEORGETA, GOJE, GH., 1997 - *Cuantificarea principalelor elemente de productivitate la un sortiment de hibrizi de porumb cu perioada diferită de vegetaţie*, , Simpozionul Cultura porumbului-prezent şi perspective, U.S.A.M.V.B. Timişoara , 21-26.
3. MUREŞAN, T., ŞIPOŞ, GH., PAULIAN, FL., MOGA, I., 1973 - *Cultura porumbului*, Ed. Ceres, Bucureşti, 260-263.
4. SIPOS, GH., SCURTU, D., SIN, GH., MOGA, I., 1981 - *Densitatea optimă a plantelor agricole*, Ed. Ceres, Bucureşti, 206.