THE CORRELATION BETWEEN THE *SEPTORIA SPP.* PATHOGEN ATTACKS AND DIFFERENT CONTENTS IN WHEAT GRAINS

EXPRESII ALE INTERDEPENDENTEI DINTRE ATACUL PATOGENILOR SI DIVERSE CONTINUTURI IN BOABE LA GRAU

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Abstract: *The phytopathology and agrochemistry research presented in this paper emphasizes data regarding the interactions of certain intrinsic factors of production involved in the evolution and manifestation of foliar disease on wheat. The effect of the interrelations between the gradual level of fertilization of the soil, between the fertilization using foliar fertilizers (Urea, Folifag), phytosanitary treatments (clorotalonil and propiconazol) and the degree of attack of the Septoria spp. fungus, as well as the multiple interactions of the named factors is obvious. The correlations between the experimental factors and the content of macro and microelements in the wheat grains were also studied. The correlations between wheat septoriosis and the content in main macro and microelements from grains and correlation to production reveals the lack of correlations statistically assured. The negative correlation between septoriosis attack and total nitrogen (r =0.3357) and manganese (r=0.372) from grains is the exception. In conclusion, between the Septoria spp attack and different contents in wheat grains decisive bound of determination was not recorded.*

Rezumat: *Cercetările din domeniul fitopatologiei şi agrochimiei prezentate în această lucrare evidenţiază date privitoare la interacţiunile dintre anumiţi factori intrinseci de producţie implicaţi în manifestarea bolilor foliare la grâu. Este evident efectul interrelaţiilor dintre nivelul gradual de fertilizare a solului, fertilizări cu ajutorul fertilizanţilor foliari (uree, Folifag), tratamente fitosanitare (clorotalonil şi propiconazol) şi gradul de atac al Septoria spp., precum şi interacţiunile multiple ale factorilor mai sus menţionaţi. Corelaţiile dintre factorii experimentali şi conţinutul în macro şi microelemente a boabelor, precum şi corelaţia cu producţia, evidenţiază lipsa corelaţiilor asigurate statistic. Corelaţia negativă dintre gradul de atac al septoriozei şi azotul (r = 0,3357) şi manganul (r = 0,372) total din boabe constituie o excepţie. În concluzie, nu s-a înregistrat o legătură directă între atacul Septoria spp. şi compoziţia boabelor de grâu.*

Key words: *phytopathology, agrochemistry, wheat, fertilizer, factors, Septoria spp.*
Cuvinte cheie: *fitopatologie, agrochimie, grâu, fertilizant, factori, Septoria spp.*

INTRODUCTION

The research made in different regions of the country have shown that, depending on the variety, the zone of culture, the climate conditions and the technology of culture applied the complex of diseases which affects the foliage of the wheat plants determines significant loses of the crop. In the climate conditions of the experimental years, the disease more frequently pointed out on the plants leaves and which have produced significant decreases of the grains production was the septoriosis produced by *Septoria spp.* fungus. Varied theories support the fact that in the appearance, evolution and manifestation of the diseases at the culture plants, an important role has the nutritional proteosynthesis balance - proteolisis (the trophobiosis' theory), fact which determined us to follow the correlations between the presence of mildew in field and the content of the wheat grains in macro- and microelements, production and raw, during the experiments.

MATERIALS AND METHOD

The researches have been conducted under the pedoclimatic conditions of Turda, in the forest steppe area of Transylvania, on a vertic clay-illuvial, chernosem soil (with a pH $_{H_2O}$ equivalent to 7.0; humus in proportion of 4.80%; P-AL equivalent to 10.5 ppm and K-AL equivalent to 102 ppm) during the years between 2005 and 2007.

The experiments have been placed according to the subdivided parcel method, randomized for polyfactorial experiences in 21 variants (each variant subdivided in three, for phytosanitary treatment) each one consisting of 4 repetitions.

The factors are:

- the a factor – soil fertilization: 0; $N_{60}P_{60}K_0$; $N_{120}P_{120}K_0$; $N_{120}P_{120}K_0$+Mo+Cu; $N_{60}P_{60}K_{60}$;$N_{120}P_{120}K_{120;}$ $N_{120}P_{120}K_{120}$ +Mo+Cu
- the b factor – foliar fertilization (with 2 treatments): 0, folifag 1% ; Urea 6%
- the c factor – chemical, phytosanitary treatment: 0; contact fungicide, systemic fungicide.

The fungicide treatment variants contained a non-treated variant, a variant treated with a contact fungicide (BRAVO 75 WP – 0.2% or 2 Kg/ha) and a variant treated with a systemic fungicide (TILT 250 EC – 0.02% or 0.5 l/ha).

Soil and plant samples have periodically and at the end of the crop period been taken out from the emplaced experiment. They have been analyzed in laboratories, according to the ICPA methodology for researches and agrochemical studies. The grain and the straw production have been registered and observations have been made upon the attack level of the *Septoria spp.* fungus, before the application of the fungicide treatment and two weeks after their application.

RESULTS AND DISCUSSION

Calculus of the correlations between the wheat septoriosis (*Septoria spp.*) and the content in principal micro and macroelements from grains but also the correlation with the production presented in figures 1-6 show the fact that there aren't coefficients of correlations assured statistically between the septoriosis from the plants and the content in phosphorus, potassium, molybdenum, copper, iron and zinc, and there exist a negative correlation assured statistically (r = - 0.3357) between the septoriosis attack and the total nitrogen in the grains and between the septoriosis attack and the manganese in the grains (r = - 0.372).

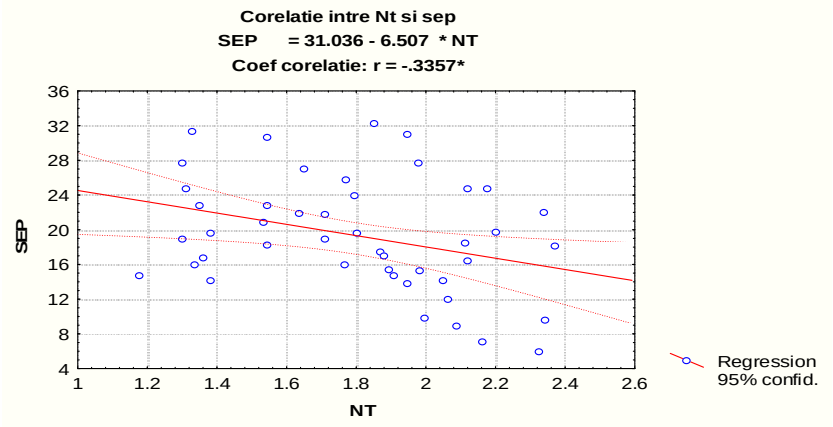

Figure 1. The correlation between septoriosis attack degree (%) and total nitrogen content in grains

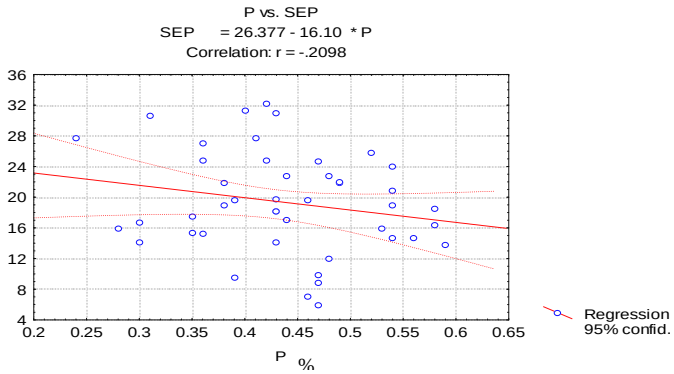

Figure 2. Correlation between septoriosis attack degree and phosphorus content in grains

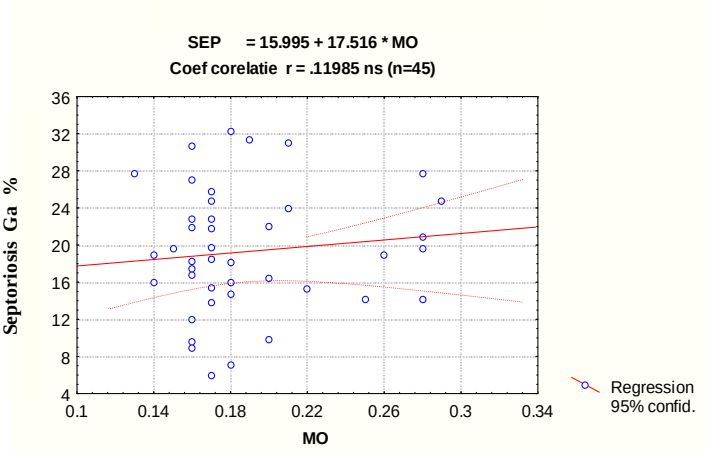

Figure 3. Correlation between septoriosis attack degree and molybdenum grains content

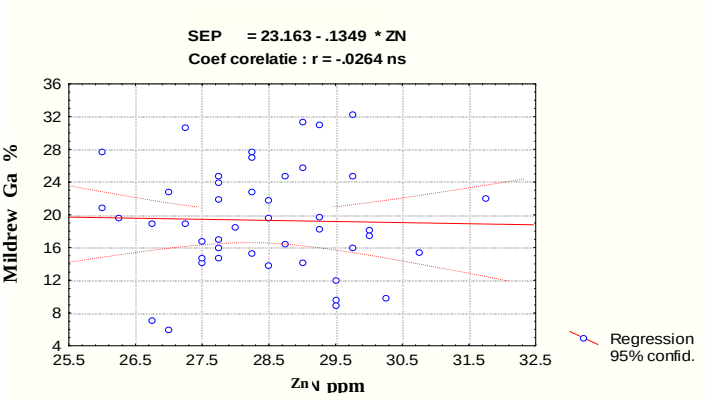

Figure 4. Correlation between septoriosis attack degree and zinc content in grains

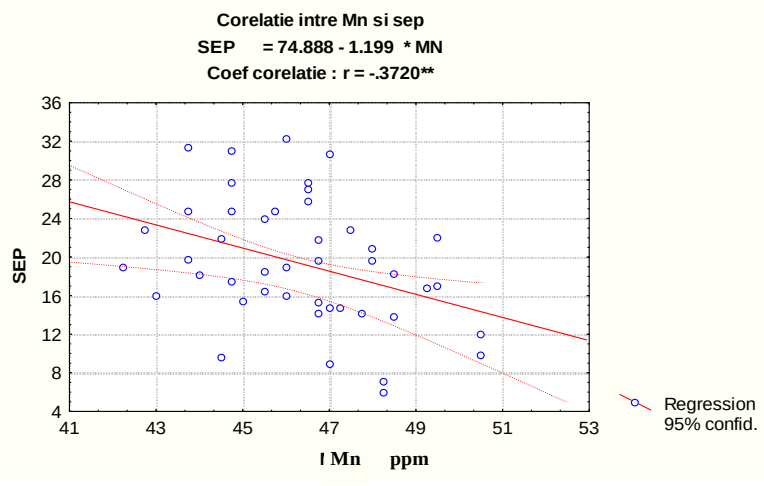

Figure 5. Correlation between septoriosis attack degree and manganese content in grains

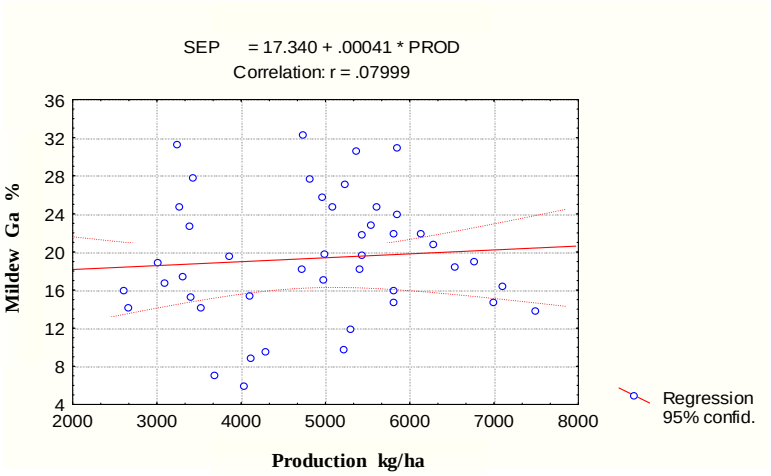

Figure 6. Correlation between septoriosis attack degree and production

Although the degree of the septoriosis attack had values pretty much higher in some experimental variants (untreated or fertilized with Urea), on the average upon the whole experience it isn't found a correlation between the septoriosis attack and the resulted production, probably the variants very attacked being dimmed by the good effect of control of other variants.

The variation of molybdenum and copper content from the wheat grains upon the influence of septoriosis attack presented as an answer surface in figure 7 synthesize a small content of molybdenum and copper in grains at the growth of the septoriosis attack with an

insignificant coefficient of statistic assurance. The potassium and phosphorus content from grains is in relation with the variation of the septoriosis attack and is described by a parable surface with the maximum on the values average (figure 8).

The answer surface regarding the variation of the total nitrogen and the potassium from grains and the septoriosis attack show a reverse dependence between the septoriosis and total nitrogen, while the potassium is in a reverse relation with the septoriosis attack (figure 9).

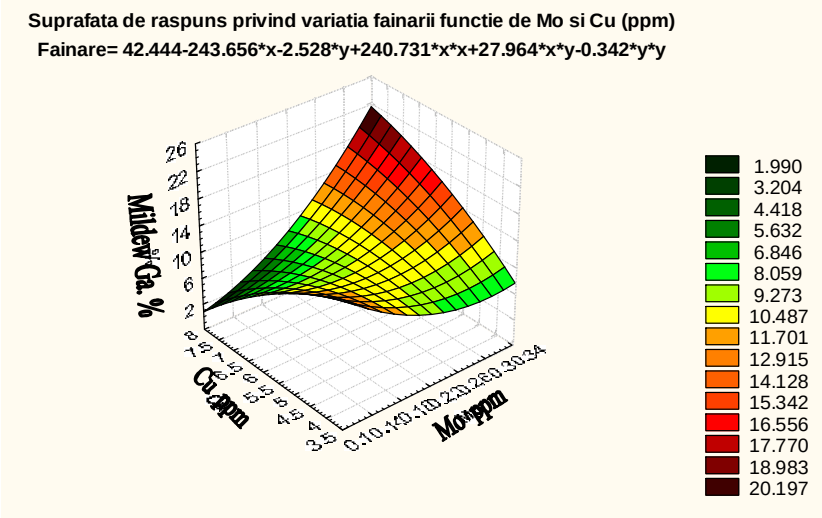

Figure 7.The answer surface about the septoriosis variation depending on molybdenum and cooper content from grains

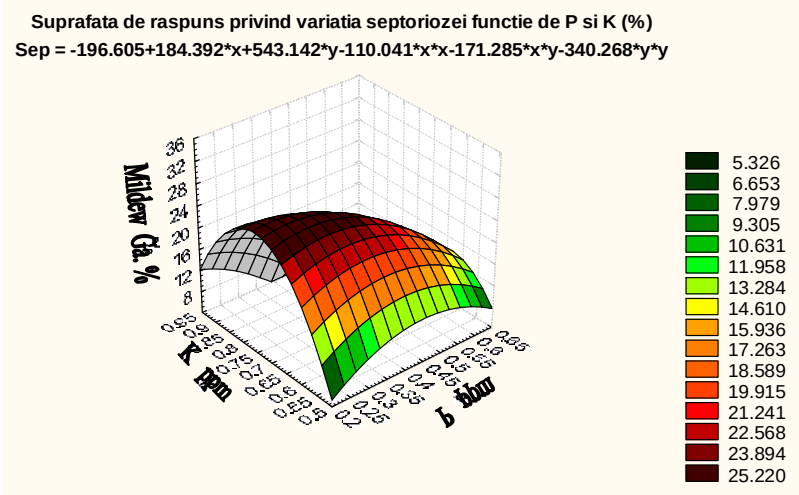

Figure 8. The answer surface about the septoriosis variation depending on phosphorus and potassium content from grains

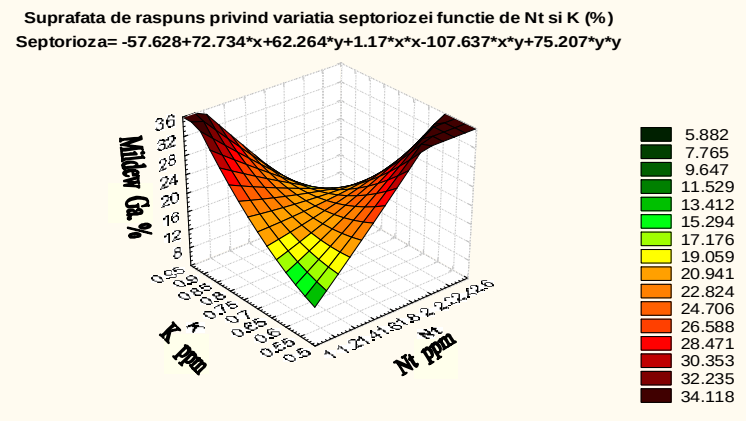

Figure 9. The answer surface regarding the septoriosis variation depending on total nitrogen and potassium content from grains

CONCLUSIONS

The calculation of the correlations between the wheat's septoriosis (*Septoria spp*.) and the content in main micro and macro elements from grains shows negative correlation statistically assured between the septoriosis attack and the total nitrogen from grains and between the septoriosis attack and the manganese from the grains.

In the rest of the situations studied it can be appreciated the fact that, between the septoriosis attack and the varied contents studied, the results are not conclusive, in the limit of the experimental errors.

The interpretation of the results through the method of the answer surfaces, regarding the variation of the total nitrogen and of the potassium from grains and the septoriosis attack show a reverse dependence between the septoriosis percent and the total nitrogen, while the potassium is in reverse relation with the pathogen's attack

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