

INFLUENCE OF FERTILIZATION WITH POTASSIC FERTILIZERS ON TOMATOES

C. URZICĂ*, M. DUMITRU, M. MUŞAT*, LAVINIA PARVAN**,
ALEXANDRA RADU***

*University of Agronomic Science and Veterinary Medicine of Bucharest

**National Institute of Research and Development of Soil Science, Agrochemistry and
Environmental Protection of Bucharest

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Abstract

The theme is intended to know the behavior of different root chemical fertilizer types, especially potash, applied to tomatoes on two soil types, taking into consideration the quality and quantity of obtained production, their retention in the soil, the risk of nitrate pollution and the impact on the environment.

INTRODUCTION

Research was carried out in green house making the quantitative and qualitative analysis on the two soil types used in experiment, either single or combined application of several fertilizer types (superphosphate, urea, potash, potassium sulphate) and after the crop harvesting. The soil used for experiment was collected from two soil types: Eutric alluvial soil (Ciorogârla) and Cambic chernozem (Ştefăneşti).

MATERIAL AND METHODS

The experiment was made by applying the pot-culture method with pots of 30 l capacity and 17 treatments x 4 replicates for each soil type. In this view a bifactorial experiment was organized such as:

A factor: soil type with two graduations: a_1 - Chernozem and a_2 - Alluvial soil.

B factor: fertilization system with 17 graduations.

No. of treatments	Treatments
b1	Control
b2	$N_{100}+KCl_{100}$
b3	$N_{100}+KSO_{4100}$
b4	$N_{100}+KCl_{150}$
b5	$N_{100}+KSO_{4150}$
b6	$P_{100}+KCl_{100}$

b7	$P_{100}+KSO_{4100}$
b8	$P_{100}+KCl_{150}$
b9	$P_{100}+KSO_{4150}$
b10	$N_{100}+P_{100}+KCl_{100}$
b11	$N_{100}+P_{100}+KSO_{4100}$
b12	$N_{100}+P_{100}+KCl_{150}$
b13	$N_{100}+P_{100}+KSO_{4150}$
b14	KCl_{100}
b15	KSO_{4100}
b16	KCl_{150}
b17	KSO_{4150}

RESULTS AND DISCUSSION

The analysis of production results led to the conclusion that the highest yields have been obtained in the case of Cambic chernozem, in contrast to the Alluvial soil where the yields were clearly lower, even if the applied technology was the same (Figure 1).



Fig. 1. Chernozem - left and Alluvial soil - right

In the both cases, the nitrogen V2; V3; V4 and V5 treatments as well as V10; V11; V12 and V13 treatments, i.e., where the highest rates were applied, the yields were the highest. Figure 1 shows the obtained yields with the two soil types.

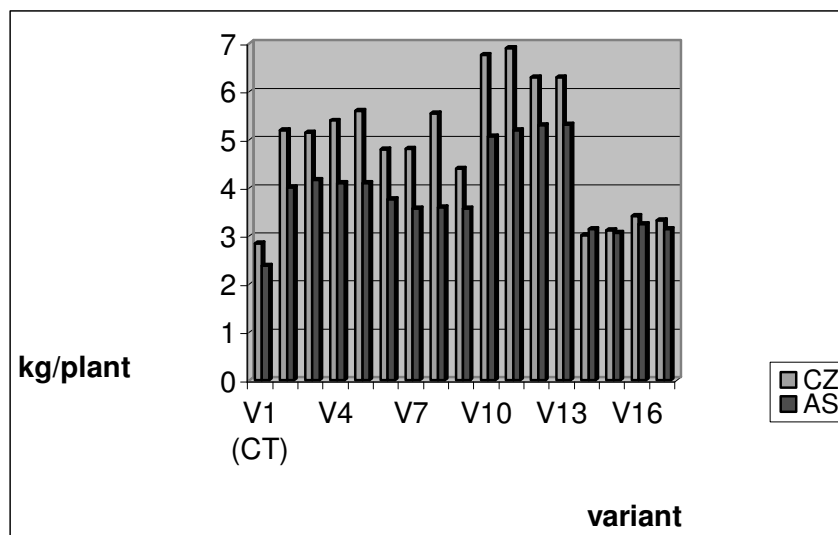


Fig. 1. Influence of fertilizers on tomato crop

The analytical data regarding total nitrogen content in tomatoes grown on the two soil types are showed in figure 2.

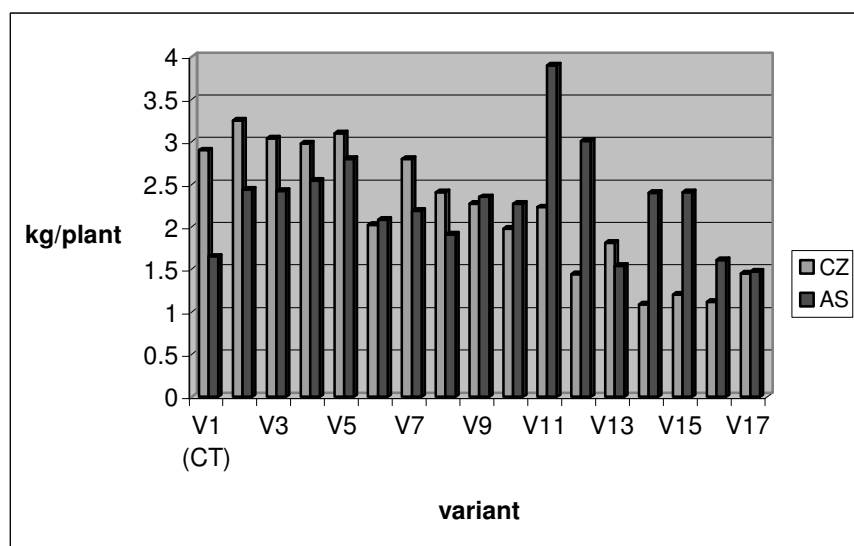


Fig. 2. Residual nitrogen in tomato fruits

The analytical data regarding total phosphorus content in tomatoes grown on the two soil types are showed in figure 3.

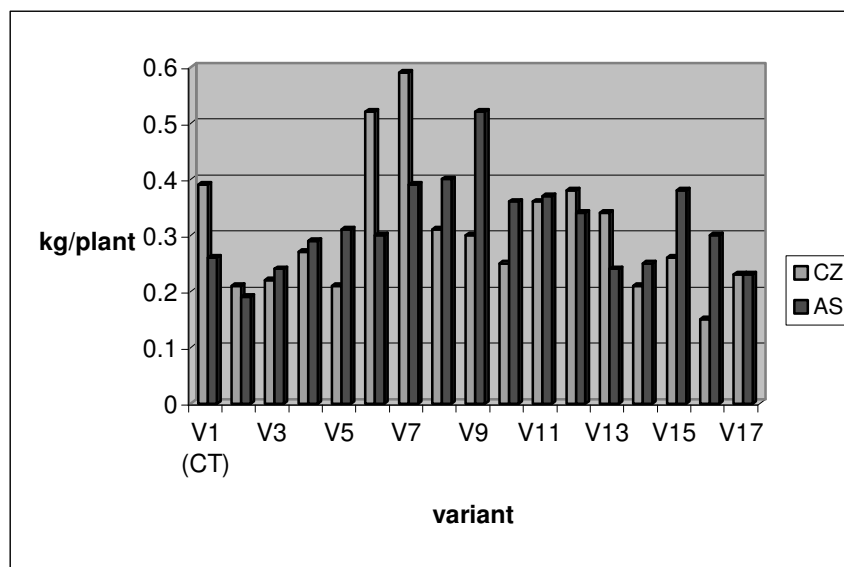


Fig. 3. Residual phosphorus in tomato fruits

The analytical data regarding total potassic content in tomatoes grown on the two soil types are showed in figure 4.

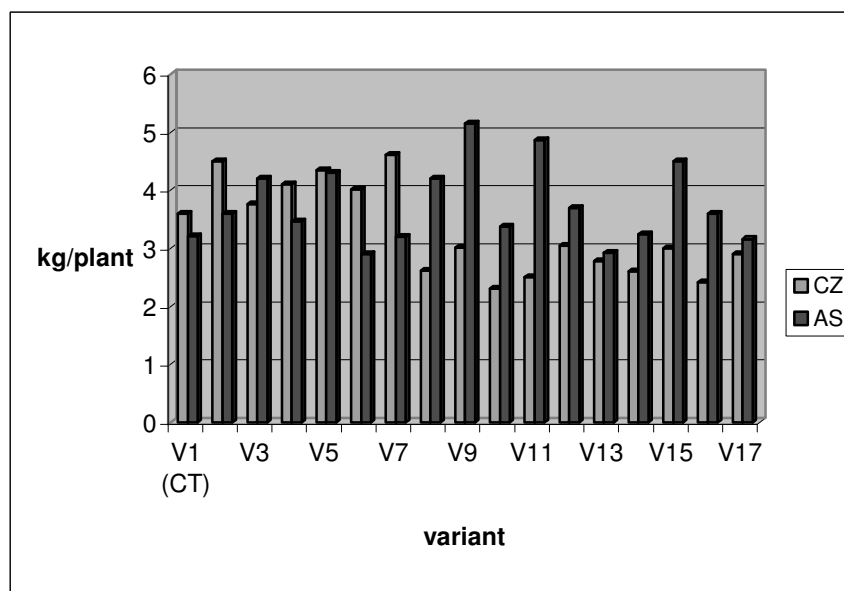


Fig. 4. Residual potassic in tomato fruits

CONCLUSIONS

1. The yields were higher in the case of Cambic chernozem as compared to the yields obtained in the case of Alluvial soil, especially with the treatments receiving nitrogen fertilizer.
2. Tomatoes quality was much higher in the case of treatments receiving phosphorus and potassium fertilizers as compared to the treatments receiving nitrogen fertilizer.
3. The nitrogen content values measured in soil after nitrogen fertilizer application were lower than the admissible limit for nitrogen soil pollution.
4. Content of nutritive elements (N, P and K) both in fruits and leaves does not show modifications as compared with the control.
5. The appearance of fruits (uniformity, color, etc.) obtained on Chernozem is much higher as compared to those obtained on Alluvial soil.

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