

RESEARCH ON THE MAIZE CROP ON THE LEVELLED AND NOT LEVELLED SANDY SOILS FROM LEFT RIVIER JIU (2004-2006)

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Abstract

With the corn crop, levelling has determined the decreasing of the yield over the not leveled soil. In this manner, the corn yield, in average on the three years of experimentation was 6,755 kg/ha with the not leveled soil and of 4,166 kg/ha with the leveled soil.

The chemical fertilization has influenced the yield in parallel with the increasing of the fertilizer doses the yield has progressively increased from 2,950 kg/ha with the not fertilized control to 6,750 kg/ha with the $N_{150}P_{80}K_{80}$ dose.

INTRODUCTION

In 1971 they were laid out at the same time on levelled and unlevelled field long time experience that were continued in the present time (more then 36 years), that fact infirming that enthusiasm of restoring the soil fertility, because the production made it on the leveled sandy soil represents only 50-60% from the ones realized on the unleveled sandy soil.

MATERIAL AND METHOD

Research was carried out on the typical sandy soil, irrigated by sprinkling from the Tamburesti D.S., from Dolj.

Experiments were made on leveled and unleveled sandy soil, stationary, with chemical fertilizers, on the autumn barley (with *Vigna sinensis* double crop as residual green fertilizer material) – corn crop rotation.

The experiments were carried out according to the blocks method, using 6 variants of fertilization in 4 replications on the leveled soil and 6 variants on the on the leveled soil.

In the 3 years of experience, they were sowing corn hybrids from FAO 400 vegetation group and the weeds control were made with Primextra 50 PU, 5.0 l/ha (preem).

On the unlevelled sandy soil, the yield growth compare with the unfertilized one-recorded values between 2,402 kg/ha and 4,652 kg/ha, and the percent growth were between 66.3% and 128.4%.

On the levelled variants also the kernel corn yield increased once with the increasing of the fertilizer doses until 5,225 kg/ha, on $N_{150}P_{80}K_{80}$. The adding on this variant of the K fertilizer didn't increase very much the yield.

The yield growth on the leveled sandy soil determined by the fertilizer doses were smaller as absolute values (1,203 kg/ha – 2,947 kg/ha), but ha percent values this ounces appear as being higher (52.8% - 129.4 %), because of the small level of the control yield unfertilized.

In this way, regarding the corn crops, the higher yield obtained on the leveled variant, fertilized with $N_{150}P_{80}K_{80}$ (5,225 kg/ha), represents only 86.7 % from the unleveled variants, fertilized with the minimum experimental dose $N_{30}P_{30}K_{30}$ (6,025 kg/ha).

The recorded yield on the kernel crops as effect of the leveling and the fertilization, are reflected by the determination during the vegetation period and on the harvest.

Before the harvest, they were determined the percents of plant with 2 corncobs, the sterility and the infection level with *Ustilago maydis* (compare with total no of plants on the 4 harvested rows). Just after the harvest, they were established the corncobs categories (completed, incomplete and small once), on percent, compare with the total no of corncobs on each variants.

In laboratories, they were determined the corn kernel efficiency, kernel humidity, the MTS, the 100 liters kernel mass and the harvest quality (the kernel contain in proteins, starch, total P and K).

The determinations of the yield elements reflected the yield level obtained on the 2 different sandy soil categories.

In this way, in function of A factor, (leveling) the percent of sterile plants recorded a higher value on the leveled variants (30.5%), compare with the unleveled one (15.7%).

The plants with 2 corn-cobs, and the categories with 2 completed corn-cobs recorded higher values on the unleveled variant, compare with the leveled one, while the incomplete corn-cobs and the small ones was higher on the leveled experiment. Also, the MTS and the 100 liters kernel mass were higher on the unleveled one compare with the leveled one.

In function of the B factor (fertilization), we can say that the percent of sterile plants recorded a diminution compare to the unfertilized control, as long the with the increasing of the fertilizer doses.

The corncobs categories shown also a differentiation, appertained to the experimental fertilizer doses. In this way, the completed corncobs percent increased from the unfertilized control, while increasing the fertilizer doses.

The MTS recorded higher values on all fertilized variants, compare with the unfertilized control. The 100 liters kernel mass, in average, in the 3 years of experimentation, recorded the highest values on the maximum fertilizer dose and the values were between 68.3 kg/hl on b₁ and 71.8 kg/hl on b₆.

The proportion of the yield elements increase with the increasing of the fertilizer dose, as well on the leveled and unleveled sandy soil. In counter part, of this index, the percent of sterile plants fluctuated; witch was higher on the unfertilized control.

The yield elements of the kernel corn crops, in function of the interaction of the 2 factors A (leveled) x B (fertilization), recorded a diminishing of the percent of sterile plants while increasing the doses of the fertilizers.

Regarding the yield quality, in the 3 years of experimentation, it results that the values of the determined elements (the protein, starch, P, K contain) fluctuated in function of research factors. As it was natural, there were recorded higher values on the unleveled variants and smaller on the leveled one, because of the reduced fertility of the sandy soil, while increasing the fertilizer doses the quality increase to.

CONCLUSIONS

1. Levelling by cutting the interdunes recrudescence the vegetation conditions for the crops, in the best case scenario only for a period of time, because of bringing into the surface of the unfertile sheet soil.
2. Unseeing the fertilizers mean a very important resource of increasing the yield corn crops, and others crops on this type of soil.
3. They do not diminishing the yield differences between leveled and unleveled or even accentuates it, because of the favorable interaction on the unleveled one, between fertilizers used and the existent humus.
4. The chemical fertilizers used every year, with all positive influence over the formation of the green cover of the plants, in the conditions of the sandy soil with hard texture, because of the powerful aeration, the humification of the very low residual material humification, the highest percent decomposing until the mineralisation.

REFERENCES

1. Baniță P. și colab., 1981. *Cultura plantelor pe nisipuri*. Ed. Scrisul Românesc, Craiova.
2. Iancu S., I. Matei și colab., 2001. *Dinamica producțiilor de porumb boabe, pe perioada 1971-2001, sub influența nivelării și fertilizării psamosurilor irigate de*

la Tamburești-Dolj. Lucrările simpozionului Ameliorarea nisipurilor slab productive din Oltenia, Craiova.

3. Nicolescu M. și colab., 1977. *Cercetări privind fertilizarea cu îngrășăminte chimice la cultura porumbului în condiții de irigare pe nisipuri.* Lucrări științifice – Stațiunea Centrală de Cercetări pentru Ameliorarea Nisipurilor Bechet, vol. II.
4. Oancea I., 1998. *Tratat de tehnologii agricole.* Ed. Ceres, București.