THE USING OF SEVERAL CROPS AND OF CHEMICAL FERTILIZERS IN ORDER TO ACHIEVE THE ECOLOGICAL REHABILITATION OF THE STERILE DUMP FROM HUSNICIOARA – MEHEDINTI

FOLOSIREA DIFERITELOR PLANTE DE CULTURA SI A INGRASAMINTELOR CHIMICE IN REABILITAREA ECOLOGICA A HALDELOR DE STERIL DIN CARIERA HUSNICIOARA – MEHEDINȚI

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Abstract: *On the sterile dumps, that is psamic entiantrosoils and have unfavourable physico-chemical features for plants there have been experimented the culture of several crops with certain fertilizer and manure doses. The wheat crop does not succeed on the sterile dumps even fertilized. The corn crop can be cropped only with chemical, organic or organomineral fertilizers. The sunflower crop can be cropped with organomineral fertilizers. The peanuts and soybean can easily succeed even with moderated fertilizer doses.*

Rezumat: *Pe haldele de steril care reprezintă din punct de vedere al tipurilor de sol un entiantosol psamic, care au însuşiri fizico-chimice defavorabile creşterii şi dezvoltării plantelor, au fost experimentată cultura diferitelor plante, cu ajutorul îngrăşămintelor chimice şi organice. Grâul nu reuşeşte pe haldele de steril chiar în condiţii de fertilizare. Porumbul poate fi cultivat numai dacă se fertilizează mineral sau organic. Floarea soarelui reuşeşte bine în condiţiile fertilizării organo-minerale. Foarte bine reuşesc culturile de leguminoase, de arahide şi soia chiar cu doze moderate de îngrăşăminte.*

Key words: *sun-flower, fertilizers, yield,*
Cuvinte cheie: *floarea soarelui, ingrasaminte, producţie*

INTRODUCTION

The surface mining of lignite brings about total or partial transformation of the soil on a period that, in most cases is over 10-15 years. There takes place the inversion and the mixing of the geological strata, the natural migration of the soil nutrients, the acceleration of the erosion process, the degradation of the landscape, the place of the former productive soil being taken by sterile dumps (Blaga G., 1990, Bromely T. B., 1990, Dumitru M., 1999, Fodgogoi K., 1983).

Within the Oltenia coal basin there are removed from the agricultural circuit up to 17,575 ha of which 13,116 ha of agricultural land and 4,159 ha of woods. Of all these terrains, there were brought back to the cropping usage 3,760 ha of which 2,716 ha of agricultural soil and 1,044 ha of woods (Buican G., 2002).

In order to enhance the speed of recovery it is need that the new surface mining quarries to be planned the recropping project in such way that the both processes to head in parallel.

Whether we analyze the economic importance of the mining activity and its harmful effect we can conclude that we have to pay more attention to the recovery activity of the former fertile lands (Mocanu R., 2001). Within the Mining Enterprise Mehedinti there were affected till now 614 ha of which 337 ha of agricultural lands and 277 of woods.

MATERIAL AND METHOD

In order to elucidate some aspects about the cropping several plants on the sterile dumps from Husnicioara, there have been set up experiments with wheat, corn, sunflower, alfalfa, that were fertilized with different doses.

The sterile dumps resulted after the surface mining of the coal have unfavourable features for the plants growth. They have replaced the former soil types of: brown reddish, clay-illuviated brown reddish, brown-luvic, brown luvic vertic, albic luvisoil, brown eumezobasic

RESULTS AND DISCUSSION

The study of the capacity of production of the sterile dumps from the Husnicioara quarry by vegetation pots have revealed that when no fertilization, the yield per vegetation pot was 4.16 g while when fertilized with $N_{100}P_{96}$ or $N_{100}P_{96}K_{80}$ it can be obtained a 4 times higher production, of 16.86 and, respectively, 14.05 g/pot.

The experiments on the sterile dumps with the wheat crop have emphasized that the average wheat yield, the 3 years of experiments is very low, 448 – 1,628 kg/ha, in comparison with the average production of the nearby soils of 2,503 kg/ha.

With the unfertilized control there can be obtained only 448 kg/ha. After the applying the lowest nitrogen dose, of N_{64}, the yield doubles, from 448 to 889 kg/ha and with the increasing of the nitrogen dose at 96 kg/ha, the yield reaches 1,023 kg/ha and with the 120 kg/ha dose, the yield is 1,411 kg/ha.

The corn crop on the sterile dumps from Husnicioara – Mehedinti have pointed out the following:

- the biomass production has varied between 1,450 kg/ha with the unfertilized control to 4,450 kg/ha with the $N_{136}P_{80}K_{80}$ dose with no manure and the average weight of a plant was 31.12 g with the unfertilized variant and 111.9 g after applying $N_{136}P_{80}K_{80}$.

- With the unfertilized control there is not obtained grain yield, so if no fertilizer, no grains on the sterile dumps

- The applying of a low nitrogen dose, of N_{64}, it conducts to the obtaining of 1,315 kg/ha, with the N_{160} dose = 1,898 kg/ha and when along with chemical fertilizers there are applied phosphorus, the yield increases to 1,993 kg/ha and when potash is added, $N_{136}P_{80}K_{80}$ the yield reaches 2,208 kg/ha.

- The using of manure (25 t/ha) along with different doses of chemical fertilizers has conducted to the obtaining of high yields: 1068 kg/ha with the unfertilized variant, 1,822-3,341 kg/ha by using N_{64}-N_{160} and 3,802 kg/ha and, respectively, 4,064 kg/ha when using N136P80 and $N_{136}P_{80}K_{80}$.

- There can be said that the corn crop does succeed on the sterile dumps from Husnicioara – Mehedinti only if the fertilizer are applied on a 25t/ha manure background.

The sunflower crop can, also, be introduced on the sterile dumps if proper fertilization is applied. In this manner, after 3 years of experiments, the using of different fertilizer doses, the yields were low, 263-853 kg/ha, the yield outputs being low in comparison with the nearby

zone. There we can point out that the applying of the phosphorus and potash fertilizers along with the nitrogen ones, $N_{136}P_{64}K_{80}$ and $N_{136}P_{64}$ have determined the increasing of the sunflower yield up to 853 and, respectively, 650.

The applying of the chemical fertilizers along with a 25 t/ha manure background has determined the doubling of the yield in comparison with the simple use of chemical fertilizers (515-1,536 kg/ha) that are close to the yields of the nearby zone.

The oil content of the sunflower seeds was also influenced by the fertilizers. The nitrogen doses of N_{64}, N_{100}, N_{136} have conducted to the decreasing of the oil content from 46.9% with the unfertilized control to 45.6%.

The applying of the phosphorus and potash fertilizers, along with the nitrogen ones have conducted to the increasing of the oil content from 48.6% to 49.5% .

The pulse crop of peanuts can succeed on these soil, the yield reaching 417 kg/ha in comparison with 100-200 kg/ha how is usually obtained on these soils when no manure is given. The organic fertilization once every three years can bring about a peanuts yield of 417-1120 kg/ha that can be taken into account because the nearby soils are not cropped or produce 1,500 kg/ha equivalent wheat.

Along with the peanuts, another pulse crop, the alfalfa can be successfully cropped on the sterile dumps and can be the future crop of these soils, both because of the yields and the ecological influence of this crop.

The using of the manure along with the chemical fertilizers determines the increasing of the yield from 1,112 up to 4,717 kg hay/ha in average on three years that are equal or even higher than the production of the nearby zone.

CONCLUSIONS

The entiantrosoil from the Husnicioara quarry, District Mehedinti, has not favourable physico-chemical features for the plant growth and especially a low fertility degree (humus 0.2-0.4%, thick sand 21-70%).

In order to achieve the ecological rehabilitation of these terrains it is need the organic and mineral fertilization for creating better nutritional condition for the crops:

- The wheat crop, does succeed less on these terrains the yields being between 448 – 1,628 kg/ha.

- The corn that is fertilized both organic and mineral can produce very well. The unfertilized variant does not give any grain yield while the $N_{136}P_{80}K_{80}$ dose can reach 2,208 kg/ha and if manure is applied, the yield can reach 4,064 kg/ha.

- The sunflower crop can contributes to the ecological rehabilitation of this zone whether is well fertilized, the yield can reach 1,536 kg/ha.

- The peanuts crop also can give good results with moderate fertilization of $N_{96}P_{64}$, 1,120 kg pods/ha.

- The best results were given by the alfalfa crop, 4,717 kg hay/ha, after applying both manure and fertilizers.

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