

# STUDY OF THE INFLUENCE OF METHODS OF SOIL TILLAGE ON PEA YIELD, IN CLIMATIC CONDITIONS AT THE A.R.D.S. VALUL LUI TRAIAN

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## ABSTRACT

*The experimental plan consists of establishing methods and technologies for the protection and improvement of the agricultural productive potential of soil and water resources, climate and implementing performance-enhancing technologies for cultivating plants with increased efficiency in the use of water and nutritional elements and it is addressed to local farmers.*

## INTRODUCTION

The pea has regained attention in crop rotation in the Dobruja area as an alternative to soybean crops (for which irrigation is needed) and as a necessity, considering the lack of rainfall during the autumn rapeseed seeding. It finds good vegetation condition and gives off high yields in every crop year, having moderate requirements of humidity and temperature, water consumption being higher during this period (Balteanu Gh., 1998).

Rainfall during the pea ripening and harvesting period is not beneficial to the crop, plants fallen to the ground are attacked by different diseases causing significant loss of yield (Georgeta Bleniuc, 2006).

Soil work made during early fall contribute towards obtaining significant surges in yields.

## MATERIAL AND METHODS

Among the established objectives of the project was the search for those technical solutions that contribute to protecting soil resources and effectively using limited water resources in Dobruja, with the effect of reducing the technological deficit of farmers and increasing their economic competitiveness.

To achieve the project's objectives in the Fitotchnical Laboratory of the Valu lui Traian Agricultural Research and Development Station an experimental bi-factorial device was installed in the field according to the subdivided parcels method, in three repetitions, each factors having three gradients, resulting in nine outcomes:

1. Factor A- water insurance regime:
  - a1 - irrigated 100%;
  - a2 - irrigated 50%;
  - a3 - not irrigated.
2. Factor B - soil work:
  - b1 - ploughed 18 - 20 cm;
  - b2 - worked with cisel at 18 - 20 cm;
  - b3 - worked with disk at 15 cm followed by the vibromix.

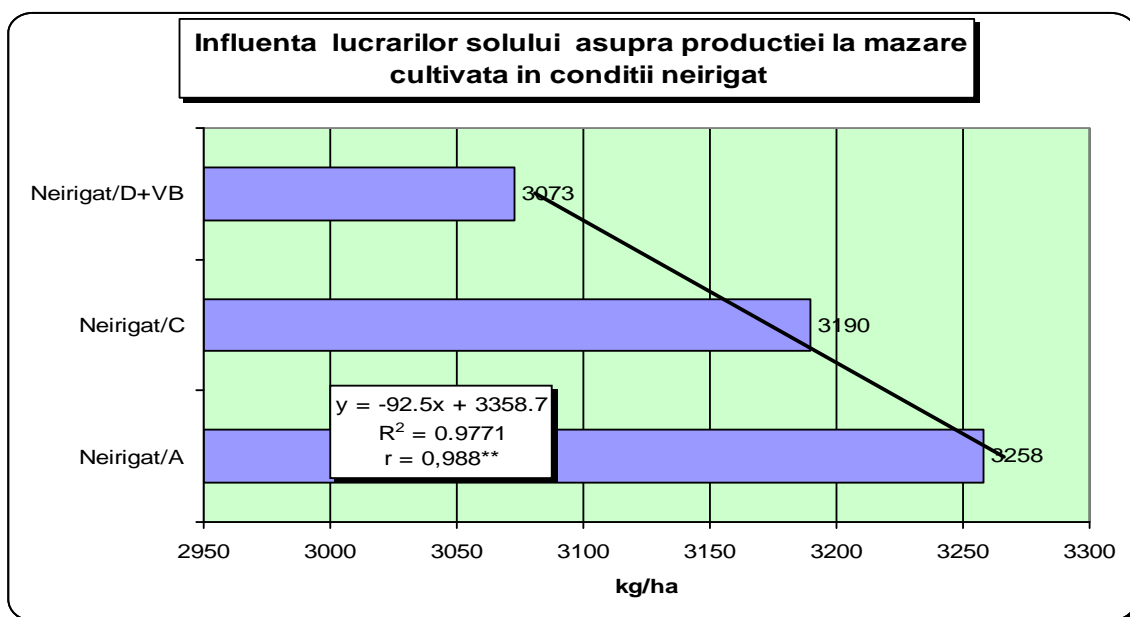
## RESULTS AND DISCUSSION

In the year 2013 the pea reacted well to the technological options tested, yield being 3258 kg/ha in the case of the ploughed version, 3190 kg/ha in the version worked with the disk and 3073 kg/ha in the version worked with the vibromix (graph 1). We observe that the version where the soil was loosened led to a better use of resources,

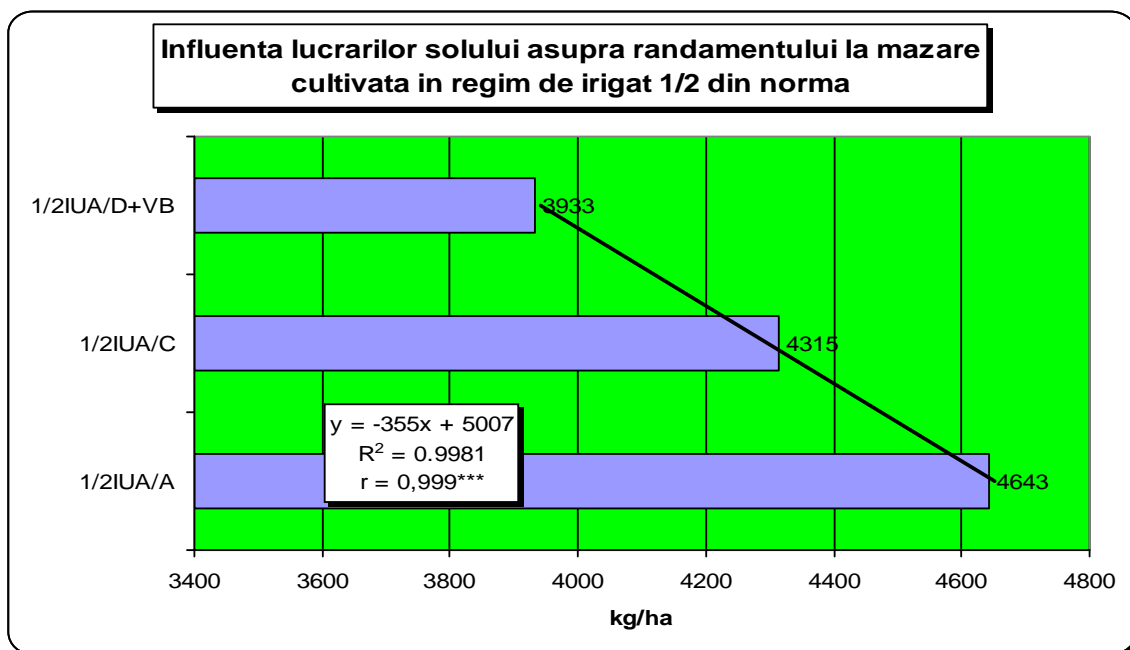
including water, the yields in the cisel and disk versions being close to the the one obtained in the the ploughed version, without irrigation. Although increases in crop sizes from one version to the other are modest, they are statistically assured as distinctly significant.

The total yield obtained in the three versions is 9521 kg/ha and average yield per experiment is 3370 kg/ha.

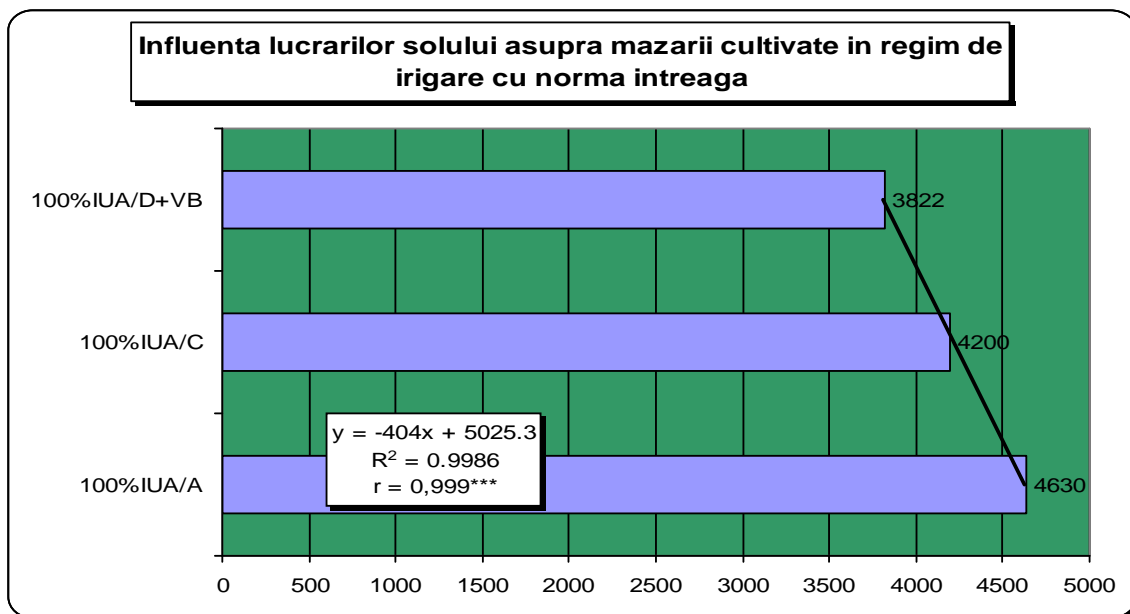
The yield obtained in technology versions tested in conditions of water supplies at 1/2 of the requirement significantly increased, the total obtained in these versions being 12891 kg/ha, the average being 4297 kg/ha (graph 2). The increase in yield obtained in versions of soil worked and irrigated with 1/2 of the water requirement relative to the one obtained in the version with soil works without any irrigation is 3370 kg/ha. Therefore, applying irrigation at the level of 1/2 of the requirement led to obtaining this increase in yield.



Graph1. The influence of metods of soil tillage on pea yield without irrigation



Graph2. The influence of metods of soil tillage on pea yield with irrigation 1/2 AUI



Graph 3. The influence of methods of soil tillage on pea yield with irrigation 100% AUI

In 2013 pea reacted well to the technological versions tested under conditions of irrigation with full water requirement. Therefore, 4630 kg/ha were obtained in the ploughed version, 4200 kg/ha in the version worked with the chisel and 3822 kg/ha in the version worked with disk and vibromix. In 2013 the pea reacted well to

Comparing total yield obtained in the versions of soil worked and irrigated with full water requirement with the one obtained in the versions with the soil worked and irrigated with 1/2 of the water yield we observe the difference to be only 239 kg/ha. This aspect proves the fact that irrigation with full requirement does not determine high increases in production with which to cover expenses so as to justify its application.

The results obtained make us consider, for each one of the three types of soil work, irrigation with 1/2 of the requirement as being the one most effectively used by the plant and that brings an increase in the economic efficiency of the crop.

## CONCLUSIONS

Summing up the yields obtained in versions of soil worked and irrigated with a full water requirement we obtain 12652 kg/ha and an average of 4217 kg/ha. Compared with total production obtained in the versions of soil worked and irrigated with 1/2 of the requirement total yield on versions of the soil worked and irrigated with full requirement is smaller by 239 kg/ha.

These aspects make obvious the fact that irrigation with full water requirement does not lead to high increases in yields so as to justify its use. The results make us consider, for all three types of soil works, irrigation with 1/2 of the requirement to be the one that leads to an economically efficient increase in crop.

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