Summary

Agriculture in Egypt faces many problems as the rarity of agricultural resources, in addition to the food gap between production and consumption. These problems led the government to put the long and short term agricultural policies to reform and develop the current agriculture policies in order to develop the agriculture sector.

Horizontal expansion considers a limited and costly expansion , so the intensive expansion in order to achieve a great benefit from the available resources especially water and soil is the most appropriate choose for the economic development stage of agriculture activity through using the modern techniques, applying the scientific knowledge , spreading the use of agriculture mechanization , producing new seeds and varieties of high productivity , using the more efficient ways of fertilizing , improving the soil, applying modern ways of irrigation and draining , in addition to develop modern control and biological control ways in order to protect the environment and to expand in organic agriculture in order to gain a relative advantage . This what we call the modern technological packages, and these packages are included in the expert systems programs which have a very important role in protecting the environment, rationalizing water consumption, producing clean production, using intensive cropping to develop the agriculture sector (animals& plants) , in addition to establish an agricultural knowledge network to be connected with the wide world web to develop the experiences of the people working in agriculture .

This research aims at studying the economic revenue of using the agricultural expert systems in producing some crops through studying the relation between the used inputs and the outputs of the sample farms from the side of marginal costs of using and applying the expert systems programs , if these costs are more than the marginal revenue or not , and from the side of the economic revenue with the purpose of supporting the farmer to take the agricultural decision which enable him of using the available agricultural production resources in the best way , in order to increase production and revenue, and to compare the use of expert systems with the traditional agriculture .

This research is based on using two methods: the induction method and the deduction method in extracting the results, that each one of them integrates the other in the field of scientific search. The research uses the descriptive and quantitative analysis techniques for the statistical data, and expressing the economic relation between the variables with the mathematical methods. Also many statistical and analytical tools were used in the evaluation and in measuring

The research depended on the chief and official resources to get data by which the dimension of the problem that we studied in this research can become clear. So the research depended on the primary data which obtained through the designed questionnaire that had been filled by CLAES about wheat during (97/98-98/99-99/2000) seasons according to the records , and questionnaire designed by the researcher for rice crop during (2001/2002-2002/2003)seasons , also the secondary data had been used .

The research includes four chapters divided in a regular and correlated way, these chapters are:-

- Chapter one: consists of tow sections , the first includes the review of literature on the applications of the expert system in agriculture , and the second includes the economic studies about the agricultural expert systems .

- Chapter two: chapter two reviews the theoretical framework of expert systems in agriculture, this chapter includes two sections , the first presents the expert system, its concept , components and its importance .The second section presents an applied patterns of using the agriculture ex pert systems including (wheat expert system – Rice expert system) .
- Chapter three : this chapter includes the economical return of applying the expert system on wheat crop in (97/98-98/99-99/2000) seasons and it consists of two sections
  a) The economical importance of applying the agricultural expert system on wheat crop in these seasons.
  b) The calculating of the production functions for wheat in the sample in these seasons.

- Chapter four: this chapter discusses the economical return of applying the agricultural expert system on rice in (2001/2002-2002/2003) seasons.

The third chapter includes the economic evaluation for applying the expert systems of wheat. After studying the production functions, it became evident that the most effective factors in increasing wheat production in the expert system are: the quantity of nitrogenous and phosphatic fertilizers and the quantity of irrigation water, and that he relation between production quantity and these factors is a direct relation. On the other hand the relation is opposite in the other system (traditional agriculture) , that emphasizes that there is an excessive use for production factors in this system , and also emphasizes the benefits of the expert system .

The efficiency of using soil element was emphasized, the average of production costs per fadden, the total return in comparison with the total unstable production costs , the feddan profit and the pound profit in the expert system in comparison with the compared system , all these assures the efficiency of the expert system

Cost functions indicated the difference between the few costs , the high profit and the production average in the expert system are lower than in the compared system, that shows the benefits of the expert system.

The most effective factors on the produced quantity of rice using the expert system in 2002 were: the quantity of seeds and the quantity of phosphatic fertilizers. The effect of these factors on the produced quantity was direct. On the compared system, it indicated that the most effective factors on the produced quantity of rice were the quantity of seeds and the quantity of phosphatic and nitrogenous fertilizers, it also indicated the opposite effect of seeds quantity on the produced quantity of rice, that emphasized that there is an excessive use in the produced quantity of seeds on production. The most effective factors on the produced quantity of rice using the expert system in 2003 are: seeds quantity and nitrogenous and phosphatic fertilizers. The direct effect of these factors was emphasized, and that there was no excessive use for these factors . While it became evident that there is an excessive use of seeds quantity in the compared

system , and what assured that the opposite effect of this factor on production quantity , while the direct effect of nitrogenous and phosphatic fertilizers became evident .

By studying the effect of zinc on production in the expert system and the compared system, the result indicated that although the used quantity of this element increased in the expert system, but the farmers in this system interests in using the modern technological packages of the expert system which recommended with using this important element Also it is indicated that there is an excessive use of water in the compared system in comparison with the expert system, and that the use of this important element must be codified.

The research also indicated the necessity of following the recommendation of the expert systems from the first stage of choose the appropriate variety , caring with the plants , fertilizing, and protect the plants from any plant disease in order to get the highest production . Although there was a shortage in the amount of used fertilizers in the compared system in comparison with the expert system , but this reflected at the end on having a great increase in production , and as a result an increase in the net revenue in the expert system in comparison with the compared system because of applying the technological packages . The results of measures of the efficiency of using soil element , the measures of total production cost average per feddan , the measures of the unstable total costs of the production in comparison with the average of the productivity of the feddan , the measures of the total return in comparison with the unstable total production costs , and the measures of the feddan net revenue and the profit of the spent pound indicated that there is an efficiency in using production elements in the field of the expert system in comparison with the compared system , that the expert system achieved more production and less costs, so the net profit becomes higher than the compared system. The differences between the expert system and the compared system become clear, in addition to the differences of fertilizing, irrigation and control that assured that the farmer using the expert system is more efficient and experienced in using the production resources than the farmer in the compared system.

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