Summary

In Egypt there is a problem in both of limited water irrigation and plantation area . Generally, Egypt depends on Nile water where it is 55.5 milliars m^3 per year because of the prospect of decrement in this portion . So, water irrigation is considered the strategical factor in Egyptian agriculture generally and in agricultural development specially. The water irrigation is considered as a first limited factor agricultural project and in horizontal and vertical extension .

This study consists of introduction in addition to four chapters and summary . The first chapter studies the sight view of economical and production of irrigation systems . This chapter consists of two sections . The first section studies the water sources and irrigation systems in Egypt . The second section contains of review of literature .The second chapter discusses the field study sample and its properties . The third chapter studies the competence of using water irrigation in the investigation's farms , the meaning of irrigation competence , the competence of water – housing in the land , the competence of distribution of water , the competence of water consumption , the competence of field irrigation , the competence of water transfer and the economical competences of irrigation systems, such as cost of water unit (1000 m^3), relative deviation of actual uses of water from water requirement of crops , total income of water unit which is used in irrigation ratio . The net revenue of water unit ratio for sample crops, total revenue cost of irrigation for different crops.

Estimating the production competence of wheat in the sample farms illustrated that , the net income per feddan from water unit in sugar beet region (flood irrigation) was 378.70 L.E. , in west Nobariah (sprinkler irrigation) was 170.74 L.E. and in Bostan (sprinkler irrigation) was 158.75 L.E . and the average of (sprinkler irrigation) for the three regions was 164.51 L.E. , the total average was 208.50 L.E. While in faba bean the net revenue per feddan for water unit was 281.28 , 190.41 , 239.05 , 214.82 and 236.66 for sugar beet (flood irrigation) region , West Nobariah (drip irrigation system), Bostan (drip irrigation system), average of drip irrigation system and average of the sample, respectively. About Berseem , the net income per feddan/water unit was amounted , 248.40 , 167.04 , 99.20 , 207.72 , 167.96 in the regions of sugar beet (flood irrigation) , West Nobariah (flood irrigation) , Bostan (sprinkle irrigation) average of flood irrigation and the average of the sample, respectively .

for white corn , the net revenue of water unit was 51.19 , 35.57 , 29.41 , 32.49 , 38.72 L.E., in sugar beet region (flood irrigation), West Nobariah (drip irrigation), Bostan region (drip irrigation), average of drip irrigation and average of the sample respectively, and in watermelon, the net income was amounted 199.85 , 106.22 , 249.59 , 170.81 and 173.06 in the regions of sugar beet (flood irrigation) , West Nobariah (drip irrigation) , Bostan (drip irrigation) , average of drip irrigation and average of the sample respectively.

for tomato the net revenue from water unit was 228.64 , 100.22 , 68.32 , 84.73 and 98.41 L.E. in the regions of sugar beet (flood irrigation), West Nobariah (drip irrigation) , Bostan

(drip irrigation), the average of drip irrigation and the average of the sample, respectively .

The fourth chapter contains the economical analysis of production functions of the sample farms which contains many variables such as planting area , seed rate , water amount of irrigation water and irrigation system as a dummy variable . These variables are supposed to have a significant effect on the dependent variables (production of unit area "feddan") . It was clearly that the Cube – Douglas model was the best. And for wheat , the liner formula was the best in sugar beet region and the production was increased by increasing seed rate . While it was decreased by increasing water amount. It means that there is wasting in water amount and we need to rationalize the using amount of it. So, reducing the using water amount by 1% increased the yield per feddan by 0.026 ardab. The total flexibility of formula was 9.96 which means that there was a correlation between increasing proceeds and the elements in the formula. These results were confirmed at significantly levels of 0.01 and 0.05 for planting area and seed rate respectively.

for faba bean , the logarismic formula was the best in the West Nobariah with drip irrigation and the production of unit area was increased by increasing both of planting area and seed rate while it decreased significantly by increasing the irrigation water amount and increasing these elements by 1% caused increment in total production by 1.6 % , 0.012 % respectively for each of planting area and water amount.

The modulus of elasticity was about 0.77 which means that increasing all elements in the formula by 1% increased the

production of unit area by 0.77 ardab in West Nobariah with sprinkler irrigation

For Berseem , the liner formula was the best at Bostan region with sprinkle irrigation and the production was decreased by increasing irrigation water and there was significant affirmative relation between each of area and seed rate and insignificant relation for water amount. There was opposite relation between Berseem production and water amount, this element was negative sign which means that there was wasting in water amount, so that increasing water amount which using in irrigation by 1% reduces the yield of feddan by 0.12 ton. So we need to rationalize the water amount which used to irrigate the unit (feddan).

Total flexibility was about 15.8 which means that increasing productivity elements by 1% increased the production by 15.8 ton per feddan.

For White Corn at sugar beet region with flood irrigation , the liner formula was the best and the production was correlated affirmatively with each of planting area and irrigation water amount and it was significant at 0.01 level for planting area . Total flexibility was 13.28 which weans that increasing the elements in the formula by 1% caused increment in total production by 13.28 % . The elasticity modulus of water was 0.092 which means that increasing this element by 1% caused increment in production by 0.092 ardab per feddan.

For Watermelon at sugar beet region with flood irrigation , the logarismic formula was the best and the production was increased by increasing all of variables in formula . And all of

these elements demonstrate the relation of production decreasing.

The modulus of elasticity was less than (1) which means that the using amount of it was at the economical level by the duty of stability the other elements. Total flexibility was 0.98 which means that increasing all elements by 1% increased watermelon yield by 0.98 ton per feddan.

for Tomato at Bostan region , the liner formula was the best and there was affirmative relation between yield and each of planting area and water amount. The formula was significant at 0.05 level but it was insignificant for water amount. While there was opposite relation between total production of tomato and seed rate. The modulus of elasticity was over than (1) and less than (1) for seed rate and water amount respectively. Total flexibility was about 10.75 which means that increasing the independent elements by 1% caused increment in production by 10.75 ton per feddan.

The review of irrigation water productivity and using the field data illustrated that it was different from crop to other and from region to other and this is correlated with using levels.

RECOMMENDATIONS

We have need of more discussion and study for water productivity. This study illustrated that there are cases of unqualified using of water in agriculture . On the other hand, there are cases refer to realization of the qualification possibility in using water specially if some specific measures were available.

This investigation is recommended the following : -

1 – Work to put a new system to distribute the water concerning about the field studies , climatic conditions , soil properties and social behavior of farmers .

2 – Training the graduates in planting the desert land and supply them with more information about using irrigation water and create a guidance instrument for these regions and support them by implements of movement.

3 – Support the graduates by finance because of the drop of their financial ability delay the land to reach the productivity and makes some of them leaves the land unfruitful or sell it secretly.

4 – Codification the reality of using water and fulfill amounts with free of charge which depend on water compensation of crops . And dictate a specific price for the excess water.

5 – Find additional water sources by mixing Drainage water after treating it, using water wells, working to decrease the losses of water in canals and drains and improving water gates to exact water distribution .

6 – Exactitude the irrigation requirements and modification the alternation system with type of crops and soils .

7 – Concerning about the projects of improving weakly production lands and arrangement between improving programs, returning fertility for planting lands and drainage projects in new lands and continue in new reclaimed lands projects.

8 – Giving the maximum efforts for agricultural scientific research centers to produce a great sequent flow of practical searches results according to the newest technological methods for new lands in environmental defending and the maintenance of water resource and rationalize of using it.

PRODUCTIVE EFFICIENCY OF IRRIGATION WATER IN RECLAIMED DESERT LANDS

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