Economic study of the impact of using some technological methods on the Egyptian Wheat crop productivity

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Abstract: The crisis of Egyptian wheat production is generally attributed to several problems. The most important one is scarcity of the agricultural lands and water limited the cultivated lands flakiness and the use of wheat crop by its production dominant state as Pressure tool on the political decision and threatens for the Egyptian national security. The wheat crop production in the North Egypt is characterized with its productivity efficiency compared to the Upper Egypt. The study of the most important factors affecting the production of different wheat Varieties shows the increase of the production factors about 10% that is leads to the increase of production rate in the North Egypt about 30.6% and in the Upper Egypt about 34.85%. Compared to the sample Varieties productivity with productivity average and The production capacity for the Variety The total wasting production size reaches about 522.4 thousand tone, and about 813.4 thousand ton that is contribute to the reduction of wheat imports rate about 5.3% and 8.3% respectively. The wheat Varieties in the sample are characterized with its ability to endure high temperature and thus its cultivation can overcome the climate changes problems, and lessening of wheat gap by cultivating the $sods_{12}$ Variety which cultivation quality in the salty lands was proved. Thus it saves about 6.5 million ton of wheat which can contribute to the reduction of Egyptian imports ratio about 66.3 %. Comparison of the spent pound return in the two areas of study show high return in the North Egypt about 39.3% compared to the Upper Egypt. Using lazar leveling can contribute to the increase of the different wheat Varieties production about 30%. This increases different Varieties costs. It was indicated that production increase rate exceeds cost increase rate. thus The most important recommendations is necessary to revive and activate the agricultural guide's role in order to contribute based on his experience to transferring the new Varieties production methods of the wheat crop, so as the farmer can realize the highest efficiency by using the available productivity resources. This will help realize the highest productivity level of the studied Varieties productivity and thus reduces the production waste, also generalization the laser leveling use in the republic leads to reduce the Egyptian imports size about 30%.

Introduction:

Egypt production of Wheat crop is estimated about 8 million tone, From planting about 3.1 million feddan in 2013[1], Annual consumption of the crop is reach about14 millions[2] ton, To fill the wheat food gap must at least double the area which Customized to cultivate wheat crop to conform with the sustained annual increase in population, Note that the individual consumption rate of the crop ranges between 180 to 200 kg / year, so that Egypt needs to increase the allocated area to cultivation at a rate annually 70 thousand feddan[3], Generally Egyptian wheat production crisis due to several problems, the most important of this problems is the scarcity of agricultural lands and limited water where Egypt's share of water amounted about 55.5 billion / m[3(4)], it is provided from outside its territory, it is the estuary state and not the source state, addition to the fragmentation of cultivated land, this is put the country to face strategy crisis, addition to the use of the wheat crop by the dominant state on the

production as a pressure tool on the political decision and threaten Egyptian national security[5].

The study Problem

Generally, food Insurance is one of the most important priorities of the Egyptian agricultural policy makers. The Wheat crop occupies a large part of this policy as is the main component in the Egyptian food. In spite of its importance, the wheat crop self-sufficiency rate does not exceed 57%,[6]. Continuing to follow that policy, this rate will be expected to decrease, Therefore it is inevitable to change current policy through working for how to increase wheat crop productivity in order to suit the probable population increase in the future.

The study Objective

The study mainly aims to raise the self-sufficiency rate possibility of the Egyptian wheat crop in order to curb the Egyptian imports invoice of this crop. It also aims to curb Egypt's dependence on the developed countries to obtain its most generally important strategic commodity. This can be achieved through studying some technological methods that

affect the wheat crop productivity and the focus on studying the most important Varieties of Egyptian wheat represented in sods $_{12}$, Gemiza$_9$, Massry 1, Sakha$_{69}$, Giza $_{30}$, Giza$_{168}$, and Massry 2. The cultivated areas of these Varieties estimated in 2013 about 73% of the total cultivated areas of the wheat crop in the Arab Republic of Egypt [1]. and aims studying the most important factors affecting the production of the Varieties under study. The study also depends on the clarification of the implications of the adoption of some farmers on the use of laser in the settlement of the land as one of the technological methods affecting the productivity of the crop.

Methodology and data sources

The research methodology has relied on some descriptive analytical techniques and the quantitative analysis through studying the production functions in order to determine factors affecting production and costs functions. The study had also relied on the variance analysis among different Varieties. And the variance analysis among different areas, about data sources the study has mainly relied on questionnaire through personally interviewing farmers in the two areas of study in the Upper Egypt and the north Egypt. In addition the study has relied on some published data in the annual bulletins of the Ministry of Agriculture and some electronic websites that have handled the topic.

Results of the study:
The wheat VARIETIES productivity in the two areas of study:

Table (1) indicates that the most important widely spread cultivated wheat Varieties in the north Egypt are restricted in sods$_{12}$, Gemisa$_9$, Massry 1, and Sakha$_{69}$. while the most important Upper Egypt wheat Varieties are represented in Giza30, Giza$_{168}$, and Massry2. The comparison of wheat feddan productivity in the two areas of study indicates that the feddan production average in the north Egypt exceeds than the Upper Egypt by about 0.408 tons/ feddan with an increase rate of about 22.4%. The most important factors affecting production are represented in the number of working hours, amount of water, seeds amount, and fertilizers amount. The table indicated that the increase working hours and seeds amount used in wheat production (feddan) in the north Egypt by about 41.77 working hours, 86.43 kg/ feddan with an increase estimated about 18.9%, and 45.8 respectively as compared to the north Egypt. As to irrigation water amount and seeds amount, the table shows their increase amount in the Upper Egypt as compared to the north Egypt by an increase estimated almost 489.84 M^3/ feddan, 10.21 kg/ feddan as an increase estimated about 29.3% and 18.2% for each of them respectively as compared to the Upper Egypt.

Table (1) The most important physical factors affecting on the different varieties production of wheat per feddan during 2014

Region	Variety	quantity of production per tons	the amount of water M3 /feddan	the number of working hours	quantity of seeds Kg/ feddan	quantity of fertilizer g/feddan
North Egypt	Sods 12	2.309	1552.00	330.22	60.00	200.00
	Gemeiza 9	2.124	1700.10	234.53	70.00	350.00
	Massry 1	2.807	1718.15	312.62	45.00	250.00
	Sakha 69	1.673	1717.53	169.84	50.00	300.00
Average North Egypt		261.80	56.25	1671.95	275.00	2.228
Upper Egypt	Giza 30	1.875	2128.00	262.30	72.41	195.68
	Giza 168	1.920	2229.29	183.00	68.77	181.21
	Massry 2	1.665	2128.07	214.80	58.20	188.83
Average Upper Egypt		220.03	66.46	2161.79	188.57	1.820

Source: - calculated and collected from the research sample questionnaires 2014

Table (2) shows the wheat crop production in the north Egypt is distinguished by productivity efficiency which represents about 75% as compared to that of the Upper Egypt which estimated almost 25%. Table (2) Also clarifies that wheat production (ton) in the north Egypt needs about 117.5 working hours, about 750.43 M^3 of irrigation water, almost 25.25 kg of seeds as compared to the production factors in the Upper Egypt. with a reduced amount reach about 3.4 working hours, almost 437.37 M^3 irrigation water and almost 11.27 kg of seeds. while wheat production (ton) in the Upper Egypt is distinguished by efficiency represents about 25%. This efficiency is clear in the fertilizers amount as the wheat production (ton) needs about 103.61 kg of fertilizers with a reduced amount by almost 19.82 kg of fertilizers as compared to the north Egypt.

Table (2) The productive efficiency of the different varieties of wheat

Region	Variety	the number of working hours	the amount of water M 3 /feddan	quantity of seeds Kg/ feddan	quantity of fertilizer Kg/feddan
North Egypt	**Sods 12**	**143.01**	**672.15**	**25.99**	**86.62**
	Gemeiza 9	**110.42**	**800.42**	**32.96**	**164.78**
	Massry 1	**111.37**	**612.09**	**16.03**	**89.06**
	Sakha 69	**101.52**	**1026.62**	**29.89**	**179.32**
Average North Egypt		**117.50**	**750.43**	**25.25**	**123.43**
Upper Egypt	**Giza 30**	**139.89**	**1134.93**	**38.61**	**104.36**
	Giza 168	**95.31**	**1161.09**	**35.82**	**94.38**
	Massry 2	**129.00**	**1278.12**	**34.95**	**113.41**
Average Upper Egypt		**120.90**	**1187.80**	**36.52**	**103.61**

Source: - calculated and collected from the research sample questionnaires 2014

Factors affecting on the different wheat Varieties production in the two areas of studying.

Factors affecting on the different WHEAT VARIETIES production in the two areas need studying production functions for different Varieties in order to determine the most important of these factors. It is indicated that Cope Douglas function figure was the most suitable figure as shown in the following table

Table (3) indicates the results of production functions of different wheat Varieties production functions estimate Results of the different varieties in the double logarithmic Analysis each of the regions in the study. For the North Egypt the determination coefficient value indicate that 0.97% of the changes in the $sods_{12}$ Variety production due to the cultivated area, the amount of seeds, the amount of nitrogen fertilizer, the number of working hours $sods_{12}$ Variety while the determinant coefficient value of $Gemiza_9$ Variety indicates that 0.79% of changes in its production due to cultivated area, Nitrogen fertilizers and irrigation water amount. The determinant coefficient value of Massry 1 Variety indicates that about 0.56% of the changes in this Variety production due to Nitrogen fertilizers amount, and number of working hours.while the determinant coefficient value of the $Sakha_{69}$ Variety indicates that 0.81%of changes in its production due to the cultivated area,seeds amount and Nitrogen fertilizers amount. Statistical Significant relationships estimated had proven at 0.01significant level as shown in Table**(3).**

The production elasticity values of the different Variables for the Varieties under study refer to the production of Varieties has opportunity to increase as follows: As $sods_{12}$ Variety, the different production elasticity values indicate that the increase of cultivated area, seeds amount, Nitrogen fertilizer and number of working hours by 10% leads to the Variety production increase about 5.2%, 2.5%, 1.4%, and 1.1%, That is the total production increase estimated about 10.2% so as the expected production reaches about 2.545 ton/ feddan as compared to the current production reach about 2.309ton/ feddan. while, the increase of the cultivated area, Nitrogen fertilizers amount, and irrigation water amount about 10% of the $Gemiza_9$ Variety leads to production increase about 2.5%, 4.4%, and 1.8%. that is the total production increase for the Gemiza 9 Variety reach about 8.7% so as the expected production reaches about 2.309 ton/ feddan as compared to the current production about 2.124 tons/ feddan., the increase of Nitrogen fertilizers and the number of working hours for Massry 1 Variety reach about 10% leads to the Variety production increase about 1% and 2.2%. That is the total production increase estimated about 3.2% and the expected production reaches about 2.897 tons/ feddan. and it clear that the increase rate for cultivated area of seeds amount and Nitrogen fertilizers amount reaches about 10% for $Sakha_{69}$ Variety leads to that Variety production increase about 4.2%, 2.7%, and 1.6%. That is the total Variety production increase estimated about 8.5% and the expected production reaches about 1.815 tons/ feddan compared to the current production estimated 1.673 tons/ feddan as shown in Table (1).

Total increase rate in the North Egypt estimated about 30.6% and the expected production in the North Egypt reaches about 6.7 million ton as compared to the current production reaches about 5.1million ton.

The determinant coefficient values for the Upper Egypt indicate about 0.97% of the changes in $Giza_{30}$ Variety production are due to irrigation water amount. while the determinant coefficient values of $Giza_{168}$ Variety reaches 093% this means that the changes in its production are due to seed amount. However the determinant coefficient values of the Massry 2 Variety indicate that about 0.97% of its production changes are due to Nitrogen fertilizers amount and irrigation water amount. Statistically estimated relationships have proven its significant at level 0.01 as illustrated in the referred table.

The production elasticity values for the different Variables of the Varieties under study have opportunity to increase the Varieties production as follows: the production elasticity value for $Giza_{30}$ Variety of the irrigation water factor indicates that the

increase amount of irrigation water about 10% leads to the increase of this Variety production about 10.45% and the expected production reaches about 2.074 ton/ feddan as compared to the current production reaches about 1.878 ton/ feddan. while the seeds amount increase about 10% leads to the increase amount of Giza$_{168}$ Variety production about 12% so the expected production reaches about 2.150 ton/ feddan as compared to the current production reaches about 1.92 ton/ feddan. As for the Massry 2 Variety the increase of irrigation water and Nitrogen fertilizers about 10%

leads to this Variety production increase by almost about 8.1% and 4.3%. thus is the total production increase estimated about 12.4% so the expected production reaches about 1.87 ton/ feddan as compared to the current production reaches about 1.665 ton/ feddan as shown in Table (1). The expected increase rate of the Upper Egypt total production is estimated about 34.9%, so the Upper Egypt total expected production reaches about 2.2 million ton as compared to the current production reaches about 1.6 million ton.

Table (3) The production functions for the most important Egyptian wheat varieties

Region	Variety	Constant Factor value	flexibility factors values for different variables					R^{-2}	F
			Area feddan	seeds kg	nitrogen fertilizer kg	hours of work a man / day	irrigation water quantity M^3		
		A	$Blogx_1$	$Blogx_2$	$Blogx_3$	$Blogx_4$	$blogx_5$		
North Egypt	Sods 12 t value	0.970	0.520 5.24	0.253 2.99	0.144 8.55	0.110 3.78	-	0.97	421.10
	Gemeiza 9 t value	0.228	0.252 2.67	-	0.440 3.23	-	0.176 2.94	0.79	46.95
	Massry 1 t value	0.353	-	-	0.100 2.61	0.220 2.98	-	0.56	6.27
	Sakha 69 t value	0.880	0.420 2.70	0.270 2.90	0.163 8.90	-	-	0.81	52.99
Upper Egypt	Giza 30 t value	2.400	-	-	-	-	1.045 18.70	0.97	352.86
	Giza 168 t value	-0.590	-	1.200 10.90	-	-	-	0.93	119.89
	Massry 2 t value	-2.600			0.430 3.800		0.810 19.08	0.97	470.0

Source: - calculated from questionnaires data

The economic efficiency estimation of the most important inputs for the wheat crop production:

As shown in Table (4) of the capacity return rate, the rate increases in all Upper Egypt Varieties while diminishes in all North Egypt Varieties except in the sods$_{12}$Variety. The economic efficiency estimation of the most important inputs for the crop production of it different Varieties represented in seeds, Nitrogen fertilizers, number of working hours and irrigation water amount, it must inter prices into the estimations as shown in Table (5). To compute the land resource value, the rental value was estimated as an average value between (3000-5000) pounds per feddan about L.E. 4000 annually per feddan. while the irrigation water value estimation in one of the studies[7] reached that one of the irrigation water pricing methods can be computed through imposing an annual tax on the farmer minimum of L.E 10 per feddan as shown in Table (5). The economic return estimation of the most important factors of wheat crop production of different Varieties, and achieving this return in a large percentage of the factors of production were its value

exceeds one. This indicates high economic efficiency of using this input in the different Varieties, This shows that economic efficiency of the use of this input is high in the different varieties, except some factors which did not reach the targeted economic return as its value was less than one. These factors are represented in the number of working hours of the sods$_{12}$ and Massry1 Varieties. This is due to the high labor wage per hour because the volume of supply in agricultural labor is lower, because of the agricultural labor emigration from the rural area to the city and changing their activities by working in other non-agricultural activities, emigration to work in the Arab or foreign states in hope of improving their standard of living. The Nitrogen fertilizers in the Massry 1 Variety also its value was less than one, du to high fertilizers price because of some traders' monopoly of the agricultural fertilizers markets in Egypt. Seeds in the Sakh$_{69}$ Variety has value less than one because the farmers' using the stored Seeds not fresh seeds in their cultivation. Thus its productivity is weak as compared to the same Variety productivity but newly produced.

Table (4) Estimation the capacity return for the different varieties of wheat

Region	Variety	flexibility factors values for different variables					flexibility value	Return Capacity Case
		Area feddan	seeds kg	nitrogen fertilizer kg	hours of work a man / day	irrigation water quantity M^3		
North Egypt	Sods 12	0.520	0.253	0.144	0.110	-	1.027	Increasing
	Gemeiza 9	0.252	-	0.440	-	0.176	0.868	Decrescent
	Massry 1	-	-	0.100	0.220	-	0.320	Decrescent
	Sakha 69	0.420	0.270	0.163	-	-	0.853	Decrescent
Upper Egypt	Giza 30	-	-	-	-	1.045	1.045	Increasing
	Giza 168	-	1.200	-	-	-	1.200	Increasing
	Massry 2	-	-	0.430	-	0.810	1.240	Increasing

Source: - calculated and collected from the table (3)

Table (5) The economic return of the most important production elements for the different varieties of wheat crop

The Region	The Variety	The production resource	The marginal product	The expected selling price per ton	The marginal product value	The productive resource value	The economic return
North Egypt	Sods 12	Area	1.201	2400	2882.4	1000	2.88
		Seeds	0.010	2400	24.00	9.00	2.67
		Nitrogen fertilizer	0.002	2400	4.80	2.89	1.66
		Number of working hours	0.001	2400	2.40	4.20	0.57
	Gemeiza 9	Area	0.535	2750	1471.25	1000	1.47
		Nitrogen fertilizer	0.003	2750	8.25	2.12	3.89
		The amount of irrigation water	0.002	2750	5.50	2.5	2.2
	Massry 1	Nitrogen fertilizer	0.001	2800	2.80	3.65	0.77
		Number of working hours	0.002	2800	5.60	5.85	0.96
	Sakha 69	Area	0.703	2775	1950.83	1000	1.95
		Seeds	0.001	2775	2.78	6.52	0.43
		Nitrogen fertilizer	0.001	2775	2.78	2.00	1.39
Upper Egypt	Giza 30	The amount of irrigation water	0.001	2800	2.80	2.5	1.12
	Giza 168	The amount of seeds	0.034	2667	90.68	15.00	6.05
	Massry 2	The amount of nitrogen fertilizer	0.004	2800	11.2	3.00	3.73
		The amount of irrigation water	0.001	2800	3.44	2.5	1.38

Source: - calculated and collected from Table (3) data, and research sample data for wheat growers during 2014

The analysis of variance among the wheat Varieties under study:

There are statistically significant differences among different Varieties as shown in Table (6) that the calculated (F) value is higher than the tabular (F) value. And the statistically significant estimated relationship was Proved at 0.01 and 0.05 Levels.

The analysis of variance between the two studying areas for the wheat Varieties:

The analysis of variance between the two studying areas for the wheat Varieties indicate that the statistically significant differences between the variables used in cultivating, the cultivated Varieties are (production, water, seeds amount, fertilizers amount and labors) in the North Egypt area.

While the differences were insignificant among these variables for the Upper Egypt cultivated Varieties, This means there were no significant differences among the Upper Egypt cultivated Varieties in terms of the used variables in their production as shown in Table (7).

Table (6) The results of the variance analysis among wheat varieties under study

Varieties The	factors The	calculated F value	Significant The
Sods 12,Gemeiza 9 Massry 1,Sakha 69 Giza 30, Giza 168 Massry 2	The production	3.630762	Significant*
Sods 12,Gemeiza 9 Massry 1,Sakha 69 Giza 30, Giza 168 Massry 2	The amount of seeds	5.940096	Significant**
Sods 12,Gemeiza 9 Massry 1,Sakha 69 Giza 30, Giza 168 Massry 2	Fertilizers	13.78887	Significant**
Sods 12,Gemeiza 9 Massry 1,Sakha 69 Giza 30, Giza 168 Massry 2	Water	2.317647	Significant**
Sods 12,Gemeiza 9 Massry 1,Sakha 69 Giza 30, Giza 168 Massry 2	The work	4.857681	Significant**

Source: - calculated and collected from the research sample data in 2014, * means significant at 5%, ** means significant at 1%.

Table (7) The results of variance analysis between the study areas for the varieties under study

The Variety Statement	Sods 12	Gemeiza 9	Massry 2	Sakha 69	Massry 1	Giza 168	Total The
The sample productivity tons / feddan	2.309	2.124	2.807	1.673	1.875	1.920	-
Average productivity Tons / feddan	3.375	3.300	3.375	3.750	3.375	3.450	-
The amount of loss Tons / feddan	1.066	1.176	0.568	2.077	1.500	1.530	-
% The average productivity loss	31.6	35.6	16.8	55.4	44.4	44.3	-
Production capacity	3.825	4.500	4.500	4.500	4.500	4.500	-
The mount of the loss Tons/feddan	1.516	2.376	1.693	2.827	2.625	2.58	-
% The Loss of productive capacity	39.6	52.8	37.6	62.8	58.3	57.3	-
The Cultivated area/ thousand feddan	72.8	22.8	7.9	97.2	39.4	99.7	339.8
Total loss 0f Average productivity/ thousand ton	77.6	26.8	4.5	201.9	59.1	152.5	522.4
Total loss of productivity capacity/ thousand ton	110.4	54.2	13.4	274.8	103.4	257.2	813.4

Source: - calculated and collected from the research sample data in 2014, * means significant at 5%, ** means significant at 1%.

Production waste of the different wheat crop Varieties:

The productivity process waste size estimation of the wheat crop for the different Varieties requires comparison of all the wheat Varieties productivity used in the research sampling, with each of the Variety productivity average and the Productive capacity of the Variety where the waste ratio are reacheabout31.6%, 35.6%, 16.8%, 55.4%, 44.4% and 44.3%. for these Varieties, The total waste amount compared to the Variety productive estimated average which reached about 522.4 thousand tone that is may be contribute to reduce of the Egyptian imports volume about 5.3 %.as cleared that the waste ratio are reached about 39.6%, 52.8%, 37.6%, 62.8%, 58.3% and 57.3% of the total waste amount compared to the productivity[7] estimated which reached about 813.4 thousand tone, may be contribute to reduce of the Egyptian imports volume about 8.3% for the sods$_{12}$, Gimeza$_9$, Massry2, Sakh$_{69}$, Massry1, Giza$_{168}$ Varieties respectively as shown in Table (8).

Also showed[8] some investigated wheat types are distinguished with their high productivity under high temperature circumstances including Massry1, Massry2 and sods12, the sods12Variety is also characterized by durability to soil salinity. It indicated that the area which has salty land that can be cultivated reaches about 2 million feddan representing about 35% of the total Egyptian lands[9]. In the case of cultivating these lands with the sods12Variety which has productivity average in the salty lands estimated about 3.45 ton/ feddan (23 Ardab). it can provide about 6.9 million tons of wheat which contribute to saving $ US 2.3 billion dollars of the Egyptian wheat

imports value. It indicated that this Variety capacity productivity can be reach about 4.2ton/ feddan (28 Ardab) if the farmers are commitment to apply THE GUIDING criteria of cultivation, To reach the highest efficiency productivity of the variety to achieve the

targeted production capacity and obtain about 8.4 million wheat tons that contributes to saving almost $ US 2.7 billion dollars of the Egyptian wheat imports value.

Table (8) The Wheat production loss for the different varieties

The Region	The Variety	The production		The Water		The amount of seeds		The Fertilizers		The work	
		calculated F value	The Significant	calculated F value	The Significant	calculated F value	The Significant	calculated F value	The Significant	calculated F value	The Significant
North Egypt	Sods 12 Gemeiza 9 Massry 1 Sakha 69	0.871	Not significant	1.106	Not significant	12.37	significant[**]	18	significant[**]	6.82	significant[**]
Upper Egypt	Giza 30 Giza 168 Massry 2	0.211	Not significant	2.144	Not significant	1.622	Not significant	0.93	Not significant	1.65	Not significant

Source: - varieties and hybrids of field crops - the Ministry of Agriculture and land reclamation - Field Crops Research Institute 2014[(8)] - Annual Statistical Bulletin of the Ministry of Agriculture, the research sample data

Comparison of the wheat crop production cost in the two areas of study:

comparison of the different Varieties production costs in the two areas of study, North Egypt Varieties have high return of the spent pound for Sakha$_{69}$ Variety About 3%, 3.5%, 10.2%, compared with SODS$_{12}$, Gemeiza 9, Massry1 Varieties, But for the Upper Egypt the study is shown that Giza 168 variety has a high return on the pound spent reach about 9.7% and about 33.7% compared with other varieties as Giza 30, MASSRY 2, respectively, also the study is shown a comparison between the areas of the study, and that the North Egypt Varieties have high return on the pound spent reach about 39.3% compared with Upper Egypt Varieties, as illustrated in table (9).

And estimating costs functions for the different varieties in the quadratic picture shows that about 95% 0.96% 0.95% 0.97% 0.94% 0.93% 0.92% of the changes in costs due to the changes in the quantity of production for sods$_{12}$, Gemiza$_9$, Massry $_1$, Sakha$_{69}$, Giza$_{30}$, Giz$_{169}$ and Massry2 respectively. the statistically relationship significant are estimated at the level of significance 0.01 are proved, and the derivation of marginal costs function and equality it with average costs function to determine the optimal size of the production as illustrated in the table (10) show that this size is achieved in North Egypt varieties but did not achieved in the upper Egypt varieties as shown in research sample data.

Table (9) compared to the production costs per ton of wheat for different varieties

The Region	The Variety	Total costs for ton	Total revenue for ton	Net return for ton	Return / the expended pound
North Egypt	Sods 12	1200.00	2400.00	1200.00	2.00
	Gemeiza 9	1380.00	2750.00	1370.00	1.99
	Massry 1	1500.00	2800.00	1300.00	1.87
	Sakha 69	1350.00	2775.00	1425.00	2.06
The average		1050.57	2681.25	1323.75	2.55
Upper Egypt	Giza 30	1460.16	2800.00	1339.84	1.918
	Giza 168	1266.93	2666.67	1399.74	2.105
	Massry 2	1778.98	2800.00	1021.02	1.574
The average		1502.02	2755.56	1253.53	1.83

Source: - calculated and collected from the research sample questionnaires

Table (10) indicates that this size is Verifies in the Varieties of $sods_{12}$ about 8.33% by a farmer at the area of 9.5 feddan. while this size is Verifies in the $Gemiza_9$ about 16.66% at the area 8 feddan by two farmers. It is also Verifies in the Massry1Variety about 8.33% at the area 6.5 feddan by one farmer. The study sampling results indicate that the optimal production size of $Sakha_{69}$ Variety was not Verifies within the research sampling. The productivity cost elasticity was Verifies at the production amount average and cost average of different Varieties as shown in the referred to Table. This means that production rate increase by 1% leads to production cost increase about 0.45%, 0.91%, 0.33%, 0.89%, 0.95%, 089% and 0.99% of $sods_{12}$, $Gemiza_9$, Massry1, $Sakha_{69}$, $Giza_{30}$, $Giza_{168}$ and Massry2 Varieties respectively as shown in Table (10).

Table (10) The optimal size of the production and costs flexibility

The Region	The Variety	The optimal size of the production	Costs flexibility	Flexibility type
North Egypt	Sods 12	26.21	0.45	Inelastic
	Gemeiza 9	22.8	0.91	Inelastic
	Massry 1	17.8	0.33	Inelastic
	Sakha 69	22.7	0.89	Inelastic
Upper Egypt	Giza 30	20.32	0.95	Inelastic
	Giza 168	29.88	0.89	Inelastic
	Massry 2	22.86	0.99	Inelastic

Source: -calculated and collected from Table (3) data, and research sample data for wheat growers during 2014

Laser leveling as one of the technological methods and its impact on the wheat Varieties productivity and feddan costs:

The research sample data indicated that using Laser[11]leveling may be contribute to increase feddan of wheat about 30% [10]. The Laser leveling cost per feddan is differs between the two areas of study as it reaches in the North Egypt about L.E. 300 per feddan while it reaches in the Upper Egypt about L.E.500 per feddan. The production cost of different Varieties ranges between a maximum rate of 20.55% of Giza169 Variety and a minimum rate of 7.13% for the Massry1Variety. The feddan productivity rate of all Varieties is increased more than the increase of feddan cost as shown in Table (11). It is expected that activate Laser leveling process the Republic production Will increase by 30%, thus the reduction of the Egyptian imports size about 2.7 million tone with value about 881.1$ US dollars.

Table (11) laser leveling effect on the wheat productivity and cost (feddan)for different varieties In the areas of study

The Region	The Variety	Feddan productivity	% increase in productivity	%increase in feddan costs	% increase in production
North Egypt	Sods 12	3.002	30	10.83	19.17
	Gemeiza 9	2.761	30	10.23	19.77
	Massry 1	3.649	30	7.13	22.87
	Sakha 69	2.175	30	13.28	16.72
Upper Egypt	Giza 30	2.438	30	18.26	11.74
	Giza 168	2.496	30	20.55	9.45
	Massry 2	2.165	30	16.88	13.12

Source: - calculated and collected from the research sample questionnaires

The most important results of the study can be summarized as follows:

- The wheat crop production in the North Egypt is characterized with its productivity efficiency compared to the Upper Egypt.

- The study of the most important factors affecting the production of different wheat Varieties shows the increase of the production factors about 10% that is leads to the increase of production rate in the North Egypt about 30.6% and in the Upper Egypt about 34.85%.

- Compared to the sample Varieties productivity with productivity average and The production capacity for the Variety The total wasting production size reaches about 522.4 thousand tone,and about 813.4 thousand ton that is contribute to the reduction of wheat imports rate about 5.3% and 8.3% respectively.

- The wheat Varieties in the sample are characterized with its ability to endure high temperature and thus its cultivation can overcome the climate changes problems. and lessening of wheat gap by cultivating the $sods_{12}$ Variety which cultivation quality in the salty lands was proved. Thus it saves about 6.5 million ton of wheat which can contribute to the reduction of Egyptian imports ratio about 66.3 %.

- Comparison of the spent pound return in the two areas of study show high return in the North Egypt about 39.3% compared to the Upper Egypt.

- Using lazar LEVELING can contribute to the increase of the different wheat Varieties production about 30%. This increases different Varieties costs. it was indicated that production increase rate exceeds cost increase rate. Generalization the laser leveling use in the republic leads to reduce the Egyptian imports size about 30%.

The most important recommendations In light of the study results:

It is necessary to revive and activate the agricultural guide's role in order to contribute based on his experience to transferring the new Varieties production methods of the wheat crop, so as the farmer can realize the highest efficiency by using the available productivity resources. This will help realize the highest productivity level of the studied Varieties productivity and thus reduces the production waste. It is also necessary to generalization the laser leveling use at the republic level through the agricultural guide, This will increase the republic production about 30%.

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