An Economic Study of the Potential Arab Integration of Levantine Maize Production

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ABSTRACT

The research aims to study the economics of Levantine maize production in the Arab world by studying the current status of Levantine maize production in the most producing countries, then statistically estimating the Levantine maize production function in the Arab world in the long term, and comparing the results.

The most important results are as follows:

1. **A study of the general trends of production, area, and productivity of Levantine maize in the Arab world shows that, although production is the product of the cultivated area and the per-feddan productivity, the increase in the total production of Levantine maize in Egypt is due to the area factor only, as the per-feddan productivity is decreasing at a significant rate. In Iraq, the relative stability in the total production of Levantine maize is due to the area factor, despite the high per-feddan productivity. In Syria, the relative stability of its production of Levantine maize is due to both area and productivity factors. In Somalia and Morocco, the decrease in production rates of Levantine maize is due to the area factor only.**
2. **By extracting the economic efficiency of using the seed element (x_1) in the production function of Levantine maize in the Arab world in the long term, the results showed that its economic efficiency is that the value of the marginal product is greater than the price of the resource, which indicates the need to intensify the use of the seed elements, and this is consistent with economic logic.**
3. **The results of the data showed that the total production elasticity of the production factors in the estimated function in the long run, which was about 0.94, indicates the nature of the decreasing return to capacity, where production decreases by a percentage less than the increase in production factors. The coefficient of determination for the estimated relationship was about 81%, which reflects the changes occurring in production and the changes responsible for the corresponding changes in the production factors. By estimating the marginal product in the long run for the amount of seeds (x_1) of Levantine maize, it amounted to about 6.09 thousand tons, and the average product was about 20.99 thousand tons, while the marginal product of the production capacity (s) was about 3.2, and the average product was estimated at about 4.9 thousand tons in the long run.**
4. **The results of the research showed that there is a weakness in the possibility of Arab integration for the production of Levantine maize.**

Keywords: Production Function, Levantine Maize, Arab Integration, Food Safety, Agri, Production.

INTRODUCTION

Levantine maize is one of the most important crops used as animal feed and is used in livestock and poultry feed. It is also considered the most important strategic Levantine maize in the Arab world. This is because it is the main component of the diet of livestock and poultry in the Arab world, as it contains high levels of carbohydrates and elements that are the main source of energy supply. Therefore, the Arab world produced around 8609.5 thousand tons during the period (2017–2021).

The research problem can be summarized in the decline in the production of Levantine maize in the Arab world, which reached about 8.3 million tons on average, with an increase in consumption, which reached about 10.2 million tons on average, and a decrease in the rates of self-sufficiency, which ranged from (30.8% - 43.8%) on average during the period (2007-2021). This resulted in an increase in the size of the food gap, during the same period. Therefore, an attempt to fill this gap was made by increasing the rates of imports of Levantine maize from other countries in the world. This affects the increase in the imbalance of the trade balance of importing countries, including the increase in the imbalance in the balance of payments. This requires the study of the production and cost functions of Levantine maize for the most important producing countries in the Arab countries to identify the most important factors determining Levantine maize production.

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THE RESEARCH AIMS

to study the economics of Levantine maize production in the Arab world by studying the current status of Levantine maize production in the most important producing countries, then estimating the statistical function of Levantine maize production in the Arab world in the long term and comparing the results.

RESEARCH METHODS AND DATA SOURCES

The study relied on descriptive and quantitative statistical analysis methods in its economic analysis, represented by the simple regression method, the stepwise regression method in estimating some models, the correlation coefficient matrix, and the derivation of production functions in the long run in a way that does not conflict with economic logic.

STATISTICS USED IN THE STUDY

A meta-production function (MPF) approach was used to estimate the production functions of Levantine maize in the Arab world. This approach used time series data for three years only for the Arab countries that produce Levantine maize, which represents about 98.8% of the total Levantine maize production in the Arab world. This approach combines time series data and cross-sectional data, thus addressing the problem of data availability and timeliness.

The most important Arab countries producing Levantine maize were selected for several reasons, including that they cover major regions such as Egypt, Morocco, Iraq, Somalia, Syria, Saudi Arabia, Jordan, Lebanon, Oman, Kuwait, Mauritania, Yemen, the United Arab Emirates, Algeria, and Sudan, which have data on their production of Levantine maize, especially data on the inputs of Levantine maize production. Eritrea, Djibouti, Qatar, Bahrain, Tunisia, and Palestine were excluded.

This is due to the difficulty of providing detailed data on its production of Levantine maize, and because Egypt produces 89.9% of the total production of Levantine maize in the Arab world, it was necessary to estimate the statistical function of Levantine maize production in the Arab world in the long term, taking into account the number of observations in each category as required for the statistical estimation of production functions.

The mathematical model used in statistical estimation

A. Production Function Models:

The standard model for estimating production functions is the double logarithmic function, which is as follows:

$$\text{Ln } q_i = \ln A + B_1 \ln X_i - B_2 \ln X_2 + \ldots\ldots B_n \ln X_n$$

Where (q_i) represents the total annual production in thousand tons, (X_1) represents the amount of seeds in thousand tons, (X_2) represents the amount of fertilizer in thousand tons, (X_3) represents the number of agricultural tractors, and (X_4) represents the number of workers used.

It was difficult to use the water allocation factor, on the one hand, due to its unavailability in some countries, and on the other hand, due to the difficulty of separating between the rainwater allocation and the irrigation allocation.

The study relied on secondary data, both published and unpublished, from various sources, such as the Food and Agriculture Organization of the United Nations (FAO), the World Bank's Global Internet Database, the United States Department of Agriculture, the International Monetary Fund, and the Arab Organization for Agricultural Development, in addition to economic studies and scientific papers related to the subject of the study.

RESULTS AND DISCUSSION

First: The current situation of Levantine maize production in Arab countries

(1) The relative importance of the most important Levantine maize -producing countries in the Arab World Based:

on the data in Table (1), it is clear that Egypt occupies the first place in the Arab world in the production of Levantine maize, where it contributes about 89.91% of the total production of Levantine maize in the Arab world. Iraq comes in second place, with its contribution reaching about 3.64% of the total production of Levantine maize in the Arab world. Syria comes in third place with a percentage of about 2.25%, while Somalia came in fourth with a contribution of about 0.87%. Morocco came in fifth place with a percentage of about 0.8% of the total production of Levantine maize in the Arab world for the period (2017-2021). Saudi Arabia, Yemen, Sudan, Jordan, Oman, Mauritania, the United Arab Emirates, Kuwait, the Comoros, and Algeria come in the sixth to fifteenth places with a contribution rate of about 0.54%, 0.47%, 0.40%, 0.21%, 0.19%, 0.17%, 0.15%, 0.14%, 0.09%, and 0.05%, respectively. Therefore, the total of the above-mentioned countries together produced about 99% of the total production of Levantine maize in the Arab world during the aforementioned period.

Table 1. Relative importance of the most important Levantine maize -producing countries in the Arab world during the period (2017-2021) (production in thousand tons)

The world	2017	2018	2019	2020	2021	Average	%
Egypt	7100.0	8260.6	7450.0	7500.0	8395.0	7741.1	89.91
Iraq	185.3	63.3	473.1	419.3	426.4	313.5	3.64
Syria	185.6	101.3	215.3	227.0	238.6	193.6	2.25
Somalia	65.0	102.0	57.0	75.0	75.0	74.8	0.87
Morocco	122.4	118.4	40.0	29.9	31.8	68.5	0.80
Saudi Arabia	15.1	44.5	47.6	59.2	64.9	46.3	0.54
Yemen	36.9	36.4	48.3	40.0	41.0	40.5	0.47
Sudan	50.0	46.0	25.0	25.0	28.1	34.8	0.40
Jordan	6.5	17.4	17.8	23.6	25.6	18.2	0.21
Oman	7.1	8.8	8.9	25.2	32.3	16.5	0.19
Mauritania	14.0	12.0	16.0	15.0	14.5	14.3	0.17
Emirates	17.1	8.2	6.7	16.0	18.5	13.3	0.15
Kuwait*	3.4	8.9	15.1	16.4	17.8	12.3	0.14
Comoros	10.9	7.0	7.2	6.3	8.2	7.9	0.09
Algeria	2.6	5.5	6.4	3.2	3.7	4.3	0.05
Libya	3.4	3.5	3.6	3.4	4.6	3.7	0.04
Lebanon	3.0	3.6	3.0	3.0	3.0	3.1	0.04
Palestine*	0.1	0.0	8.3	0.0	0.0	1.7	0.02
Qatar*	1.7	1.9	0.6	0.9	0.9	1.2	0.01
The Arab world	7830.0	8849.4	8449.9	8488.5	9070.8	8609.5	100

Source: The Arab Organization for Agricultural Development's website, various issues.

* : The table above does not include Palestine (due to the occupation and the difficulty of obtaining data on the production of Levantine maize) or Qatar, Djibouti, Bahrain, Tunisia, and Eritrea (also due to the difficulty of obtaining data on the production of Levantine maize).

(2) Statistical estimation of the general temporal trends in the production of Levantine maize for the most important producing countries in the Arab world:

-The development of the total production, area, and per-acre productivity of Levantine maize in the Arab world during the period (2007–2021).

- Development of the total production of Levantine maize in the Arab world.

The data in Table 2 show that the production of Levantine maize during the study period ranged from a minimum of about 6.9 million tons in 2011 to a maximum of about 7.9 million tons in 2021, with an average annual production of about 7.8 million tons during the period (2007–2021).

By estimating the equation for the general temporal trend in the development of Levantine maize production in the Arab world, Table 3 shows the results of statistical estimates for the period (2007–2021). It follows that Levantine maize production in the Arab world is taking an increasing general trend, with an annual statistically significant amount of about 109.3 thousand tons. The coefficient of determination (R^2) was 0.56, which means that 56% of the total changes in Levantine maize production in the Arab world are due to changes reflected by the effect of the time variable.

By studying the temporal trends of the development of Levantine maize production in the most important producing countries in the Arab world, as shown in Table 2, during the period (2007–2021), the following is evident:

a - The average product of Levantine maize for the most important Levantine maize-producing countries in the Arab world, which are as follows (Egypt, Iraq, Syria, Somalia, and Morocco), during the study period, reached about 7127.9 thousand tons, 344.7 thousand tons, 181.2 thousand tons, 99.6 thousand tons, and 121.1 thousand tons during the period (2007–2021).

Table 2. Evolution of the total production of Levantine maize in the Arab world during the period (2007–2021) (thousand ton)

Countries	Egypt	Iraq	Syria	Somalia	Morocco	The Arab world
2007	6243.6	383.9	177.0	98.9	94.7	7326.7
2008	6496.3	377.6	202.9	139.5	144.9	7654.6
2009	6605.6	238.0	183.3	111.0	204.5	7666.0
2010	6098.8	267.0	133.1	111.0	279.1	7181.3
2011	5831.5	235.7	298.4	133.6	221.3	6967.8
2012	6894.7	503.0	259.2	96.0	90.2	8140.4
2013	6364.2	830.9	260.0	149.0	118.0	8006.2
2014	8059.9	289.3	67.1	110.6	97.4	8948.6
2015	7800.2	182.3	89.1	106.6	95.0	8273.3
2016	7817.6	295.5	79.3	63.3	128.8	8384.5
2017	7100.0	185.3	185.6	65.0	122.4	7658.3
2018	8260.6	63.3	101.3	102.0	118.4	8849.4
2019	7450.0	473.1	215.3	57.0	40.0	8449.9
2020	7500.0	419.3	227.0	75.0	29.9	8488.5
2021	8395.0	426.4	238.6	75.0	31.8	9070.8
Average	7127.9	344.7	181.2	99.6	121.1	8071.1
minimum	5831.5	63.3	67.1	57.0	29.9	6967.8
maximum	8395.0	830.9	298.4	149.0	279.1	9070.8

Source: - The Arab Organization for Agricultural Development (AOAD)

Table 3. Statistical estimation of the general temporal trends in the production of the most important Levantine maize-producing countries in the Arab world during the period (2007–2021) (quantity in thousand tons)

Series	Country	Equation	R^2	F
1	Egypt	$Y_{1T}= 2880.5+146.5\ X_T$ (4.57)**	61	20.9
2	Iraq	$Y_{2T}= 255.2-1.09\ X_T$ (-0.9)	00	0.01
3	Syria	$Y_{3T}= 205.1-0.92\ X_T$ (-0.2)	00	0.04
4	Somalia	$Y_{4T}= 854.5-4.1\ X_T$ (-3.1)**	44	10.2
5	Morocco	$Y_{5T}= 205.3-10.1\ X_T$ (-3.07)**	42	9.45
6	The Arab world	$Y_{6T}= 2122.5+109.3\ X_T$ (4.12)**	56	17

Source: Collected and calculated from the data published on the website of the Arab Organization for Agricultural Development.
Where:
(Y_T) is the estimated value of the production of Levantine maize for the countries mentioned above in thousands of tons during the period (2007–2021).
(X_T) represents the years for the period (2007–2021).
(*) Significance level at 0.05; (**) Significance level at 0.01
The non-significance of any of the appropriate mathematical models for the countries of (Iraq, Syria)

b -As can be seen from Table (3), Egypt is the only country whose production of Levantine maize is increasing statistically significantly by about 146.5 thousand tons per year, and the coefficient of determination (R2) reached about 0.61, which means that 61% of the total changes in the production of Levantine maize in Egypt are due to the changes reflected by the effect of the time variable.

c -There are countries whose production of Levantine maize is decreasing statistically significantly, namely Somalia and Morocco, where production is decreasing by about 4.1 thousand tons and 10.1 tons per year, respectively. The significance of the estimated parameters has been established, and the coefficient of determination is estimated at about 44% and 42%, respectively. The calculated value of (f) indicates the validity of the linear model and the nature of the data.

d - There are countries whose production of Levantine maize is relatively stable (an increase or decrease in the production of Levantine maize is not significant), namely Iraq and Syria.

- A Development of the Area of Levantine Maize in the Arab World

Data from Table 4 shows that the area of Levantine maize in the Arab world during the study period ranged from a minimum of about 1.2 million hectares in 2015 to a maximum of about 1.8 million hectares in 2021, with an average annual area of about 1.5 million hectares during the period (2007–2021).

And by estimating the equation of the general temporal trend of the development of the area of Levantine maize in the Arab world, Table 5 shows the results of the statistical estimation during the period (2007–2021). From it, it is clear that the area of Levantine maize in the Arab world is taking a general increasing trend by an annual amount that is statistically insignificant, reaching about 9.6 thousand hectares, where it appears that the data revolves around its arithmetic mean between the increase and the decrease.

By studying the temporal trends of the development of the area of Levantine maize in the most important producing countries in the Arab world, as shown in Table 4 during the period (2007–2021), the following is evident:

a. The average area of Levantine maize in the five leading producing countries in the Arab world (Egypt, Iraq, Syria, Somalia, and Morocco) during the study period (2007–2021) was about 975.1 thousand hectares, 118.8 thousand hectares, 45.2 thousand hectares, 156.4 thousand hectares, and 151.3 thousand hectares, respectively.

Table 4. Evolution of the area of Levantine maize in the Arab world during the period (2007–2021) (thousand ton)

Countries	Egypt	Iraq	Syria	Somalia	Morocco	The Arab world
2007	775.6	155.0	50.4	235.0	228.3	1577.7
2008	802.7	160.2	54.8	257.0	209.4	1617.6
2009	837.2	114.3	41.8	192.0	223.5	1530.5
2010	824.8	117.0	37.9	192.0	230.1	1535.5
2011	744.7	128.7	59.1	206.8	191.9	1442.6
2012	878.3	151.0	61.1	185.0	118.1	1506.9
2013	814.9	199.5	62.0	123.6	178.0	1498.7
2014	1039.2	94.5	24.6	163.2	137.4	1759.2
2015	837.2	57.3	33.6	189.8	126.0	1243.8
2016	1027.7	76.0	17.7	108.1	138.8	1368.3
2017	920.6	55.7	48.6	100.0	130.7	1255.6
2018	1101.6	139.6	27.1	93.0	148.2	1608.0
2019	994.8	128.8	56.2	100.0	65.0	1447.8
2020	1458.9	101.4	50.4	100.0	71.1	1896.7
2021	1568.9	103.4	52.5	100.0	73.1	1897.8
Average	975.1	118.8	45.2	156.4	151.3	1545.8
minimum	744.7	55.7	17.7	93.0	65.0	1243.8
maximum	1568.9	199.5	62.0	257.0	230.1	1897.8

Source: The internet (Arab Organization for Agricultural Development (AOAD)).

b. As shown in Table 5, Egypt is the only country where the area of Levantine maize is increasing statistically significantly, by about 43.6 thousand hectares per year. The coefficient of determination (R^2) was about 0.64, which means that 64% of the total changes in the area of Levantine maize in Egypt are due to changes reflected by the time variable.

c. The areas of Levantine maize in Somalia and Morocco are decreasing statistically significantly, by about 11.2 thousand hectares and 11.5 thousand hectares per year, respectively. The significance of the estimated parameters was established, and the coefficient of determination was estimated to be about 81% and 80%, respectively. The calculated value of (f) indicates the validity of the linear model and the nature of the data.

d. The areas of Levantine maize in Iraq and Syria are relatively stable (an increase or decrease in the area of Levantine maize is not significant).

- The evolution of the productivity of Levantine maize in the Arab World

The data in Table 6 show that the average productivity of Levantine maize in the Arab world during the study period was about 5.3 tons/hectare during the period (2007–2021).

By estimating the equation of the general temporal trend of the evolution of the productivity of Levantine maize in the Arab world, Table 7 shows the results of the statistical estimation during the period (2007–2021).

It can be seen that the productivity of Levantine maize in the Arab world shows a general increasing trend by an annual amount that is statistically insignificant at about 0.04 tons per hectare. It can be seen that the data revolve around its arithmetic mean between increase and decrease.

By studying the temporal trends of the evolution of the productivity of Levantine maize in the most important producing countries in the Arab world, as shown in Table 6, during the period (2007–2021), the following can be seen:

a. The average productivity of Levantine maize for the most important producers of Levantine maize in the Arab world, which are as follows (Egypt-Iraq-Syria-Somalia-Morocco). During the study period, was about (7.5 tons/hectare, 3.2 tons/hectare, 3.9 tons/hectare, 0.7 tons/hectare, and 0.8 tons/hectare), during the period (2007–2021).

Table 6. Evolution of Levantine Maize Productivity in the Arab World During the Period 2007–2021) (ton/hectares)

Countries	Egypt	Iraq	Syria	Somalia	Morocco	The Arab world
2007	8.1	2.5	3.5	0.4	0.4	4.6
2008	8.1	2.4	3.7	0.5	0.7	4.7
2009	7.9	2.1	4.4	0.6	0.9	5.0
2010	7.4	2.3	3.5	0.6	1.2	4.7
2011	7.8	1.8	5.0	0.6	1.2	4.8
2012	7.9	3.3	4.2	0.5	0.8	5.4
2013	7.8	4.2	4.2	1.2	0.7	5.3
2014	7.8	3.1	2.7	0.7	0.7	5.1
2015	9.3	3.2	2.7	0.6	0.8	6.7
2016	7.6	3.9	4.5	0.6	0.9	6.1
2017	7.7	3.3	3.8	0.7	0.9	6.1
2018	7.5	4.5	3.7	1.1	0.8	5.5
2019	7.5	3.7	3.8	0.6	0.6	5.8
2020	5.1	4.1	4.5	0.8	0.4	4.5
2021	5.4	4.1	4.5	0.8	0.4	4.5
Average	7.5	3.2	3.9	0.7	0.8	5.3

Source: collected and calculated from data published on the internet by the Arab Development Organization.

Table 7. Statistical Estimation of the General Temporal Trends in the Productivity of the Most Important Levantine Maize-Producing Countries in the Arab World during the Period (2007–2021) (productivity in tons/hectare)

Series	Country	Equation	R^2	F
1	Egypt	$Y_{1T}= 2.7-0.13\ X_T$ (-2.5)**	34	6.7
2	Iraq	$Y_{2T}= 3.7+0.15\ X_T$ (5.04)**	66	25.4
3	Syria	$Y_{3T}= 3.1+0.02\ X_T$ (0.5)	0.02	0.22
4	Somalia	$Y_{4T}= 2.9+0.1\ X_T$ (1.4)	14	2.2
5	Morocco	$Y_{5T}= 3.5-0.02\ X_T$ (-1.2)	10	1.4
6	The Arab world	$Y_{6T}= 7.7+0.04\ X_T$ (1.02)	0.07	1.04

Source: Collected and calculated from the data published on the website of the Arab Organization for Agricultural Development.
Where:(Y_T) is the estimated yield value of Levantine maize for the countries mentioned above in tons per hectare during the period (2007–2021).
(X_T) represents the years for the period (2007–2021). (*) is the significance level at 0.05, and (**) is the significance level at 0.01.
No statistical significance of any of the appropriate mathematical models was found for the countries (Syria, Somalia, Morocco, and the Arab world).

The previous presentation shows that although production is the result of the cultivated area and per-feddan yield, it was found that the increase in the total production of Levantine maize in Egypt is due to the area factor only, as the per-feddan yield is decreasing at a significant rate.

In Iraq, the relative stability in the total production of Levantine maize is due to the area factor, despite the high per-feddan yield.

In Syria, the relative stability of its production of Levantine maize is due to both area and yield factors.

In Somalia and Morocco, the decline in production rates of Levantine maize is due to the area factor alone.

Second: Statistical estimation of Levantine maize production functions in the Arab world in the long term

This section deals with the statistical estimation of Levantine maize production functions in the Arab world in the long term. The results of the data in Table (3) showed the total production elasticity of production factors in the estimated function in the long term, which was about 0.94, a decreasing marginal return nature where production decreases by a percentage less than the increase in production factors. The coefficient of determination for the estimated relationship was about 81%, which reflects the changes occurring in production and the changes responsible for them in the corresponding production factors. The estimated marginal product in the long term for the amount of seed (x_1) of Levantine maize was about 6.09 thousand tons, and the average product was about 20.99 thousand tons, while the marginal product of the production capacity (s) was about 3.2, and the average product was estimated at about 4.9 thousand tons in the long term.

Table 8. Statistical estimation of Levantine maize production functions in the Arab world in thousands of tons

Production Flexibility	F	R^2	Estimated function	Type
0.94	88.1	0.81	$\ln y = 1.3+ 0.29\ln x_1 + 0.65\ln s$ (2.1)* (6.5)**	Total

Source: Collected and estimated from the statistics of the annual publications of the Arab Organization for Agricultural Development.
Where:($\hat{Y}_1$) is the estimated value of Levantine maize production in thousand tons.
(x_1) is the amount of seed in thousand tons.
(s) is the area in thousand hectares.
The numbers in parentheses below the estimates are the calculated t-values for these estimates. An asterisk (*) indicates significance at the 0.05 level, and a double asterisk (**) indicates significance at the 0.01 level.

Table 9. Estimates of Marginal Product and Average Yields According to Production Input Elements in Estimating the Production Function of Levantine Maize in the Arab World in the Long Term during the Period (2019-2021)

Categories	Quantity of seeds (X1)		Quantity of fertilizer (X2)		Number of tractors (X3)		Production capacity (cultivated area) (S)	
	Average product	Marginal product	Average product	Marginal product	Average product	Marginal product	Average product	Marginal product
Total	20.99	6.09	-	-	-	-	4.9	3.2

Source: Collected and calculated from Table 2.
(-) indicates the absence of the variable in the function.

2-Statistical estimation of the economic efficiency of using elements of the production of Levantine maize in the Arab world

By extracting the economic efficiency of using the seed element (x1) in the long run.

The results shown in Table 9 indicate that, by estimating the economic efficiency, it is necessary to intensify the use of the seed element, and this is in line with economic logic.

CONCLUSION

The research concluded the need to study the possibility of integration in the production of Levantine maize for the most important producing countries in Africa due to the weak possibility of Arab integration in the production of Levantine maize, as shown by the research results.

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الملخص العربي

دراسة اقتصادية لمدى إمكانية التكامل العربى لانتاج الذرة الشامية

عبداللطيف السيد عبداللطيف عبدالله ، ثناء النوبى احمد سليم ، منى كمال رياض

يستهدف البحث دراسة أقتصاديات انتاج الذرة الشامية بالوطن العربى من خلال دراسة الوضع الراهن لانتاج الذرة الشامية لاهم الدول المنتجة له، ثم التقدير الاحصائى لدالة انتاج الذرة الشامية بالوطن العربى في المدى الطويل ، ومقارنة النتائج.

وقد أسفرت أهم النتائج الى ما يلى:

1 – يتبين من دراسة الاتجاهات العامة لانتاج ومساحة وانتاجية الفدان للذرة الشامية في الوطن العربى ، أنه بالرغم من أن الإنتاج هو محصلة المساحة المزروعة والإنتاجية الفدانية، الا أنه تبين أن الزيادة في حجم الإنتاج الكلى من الذرة الشامية في مصر يرجع الى عامل المساحة فقط، حيث أن إنتاجية الفدان منها تتناقص بمعدل معنوى. أما في العراق فان الاستقرار النسبى في الإنتاج الكلى من الذرة الشامية يرجع لعامل المساحة بالرغم من ارتفاع إنتاجية الفدان منها. اما سوريا فان الاستقرار النسبى في انتاجها من الذرة الشامية يرجع لعاملى المساحة والإنتاجية معا. أما الصومال والمغرب فان التناقص في معدلات الإنتاج من الذرة الشامية بها يرجع الى عامل المساحة فقط .

2 –باستخراج الكفاءة الاقتصادية لاستخدام عنصر التقاوى (x1)، فى دالة أنتاج الذرة الشامية بالوطن العربى في المدى الطويل، أوضحت النتائج الي أن الكفاءة الاقتصادية لها أن قيمة الناتج الحدى أكبر من سعر المورد، مما يشير الى ضرورة تكثيف أستخدام عنصرى التقاوى، وهذا متفق مع المنطق الاقتصادى.

3 –واوضحت نتائج البيانات ان المرونة الانتاجية الاجمالية لعناصر الانتاج فى الدالة المقدرة فى المدى الطويل والتى بلغت نحو 0.94 طبيعة العائد للسعة المتناقص حيث يتناقص الانتاج بنسبة اقل من زيادة عناصر الانتاج، وقد بلغ معامل التحديد للعلاقة المقدرة نحو 81 %، وهذا يعكس التغيرات الحادثة فى الانتاج والمسؤول عنها التغيرات المناظرة بالعناصر الانتاجية، وبتقدير الانتاج الحدى فى المدى الطويل لكمية التقاوى (x_1) من الذرة الشامية بلغ نحو 6.09 الف طن، وبلغ الانتاج المتوسط بنحو 20.99 الف طن، بينما بلغ الانتاج الحدى للسعة الانتاجية (s) نحو 3.2، وقدر الانتاج المتوسط بنحو 4.9 الف طن، فى المدى الطويل.

4– تبين من نتائج البحث ان هناك ضعف في إمكانية التكامل العربى لانتاج الذرة الشامية.