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Research article

STRUCTURES AND PERSPECTIVES OF CEREAL SEEDS PRODUCTION AND USE, IN IRAQ

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ABSTRACT: In this paper regarding the situation of Iraq we are tackling the production issue and the use of seeds for the main cereal crops (wheat, barley, and maize). Based on a pertinent methodology, the paper starts from the stringent need to produce seed quantities, while the arguments are based on the processing results of the information in the annual dynamics. We are making knowledge references on the used quantities, but also on the seed provisioning. By means of presenting and extrapolating the production functions, we discover the limits and conditions for the production factors use extension on the production. It emerged that for the analyzed crops, the seed quantity factor is predominant in increasing the cereal production volume.

Keywords: seed registration/supply**,** plant biological/technological structure, seed system, varieties/hybrids, pre-basic seed (S), basic seed (B), certified seed (C), (exponential) production functions, determination/correlation coefficient, correlative intensity**.**

INTRODUCTION

With this paper we aim at knowing the current situation and the tendencies in the production and use of seeds in Iraq, with exemplification for the main cereal crops (wheat, barley, maize). The structure of the performed investigations was to clarify particular aspects regarding the necessity and the seed importance on the agricultural production; the current existence of varieties/hybrids and the tendency to amplify/renew them; the current knowledge on the necessary seed quantities as a agricultural system situation result (which also determines the necessary seed quantities for the cereal crops group); the productions obtained levels by the seed producer organizations and their capacities current structure for the national needs; the factors involved demarcation in the production levels results and the intensity of these factors' influence**;** the certain essential forecasts quantification by extrapolating some exponential functions (*x* representing the factors, and *y* the obtained production); the correlations and the forecasting boundaries between the production agricultural results and capacities for the main cereal crops.

RESEARCH METHODOLOGY

It was centered on the tendency to process data through which the results will represent a quantitative and qualitative interpretation in approaching the manifestation forms for seed production and use. This procedure was based on the knowledge and the processing of data in the annual dynamics, which was later used to perform time and space comparisons. By calculating the indicators presented in absolute and relative values, we aimed at obtaining a quantitative and qualitative demarcation in the variation issue approach of the seed production/uses, the varieties/hybrids number, the cultivated areas, and so on. For the important three cereal crops for Iraq (wheat, barley, and maize), we analyzed the system and the correlative intensity by using the exponential form of the production functions, of the determination coefficients and the multiple correlation coefficient. The production factors were represented by the quantity of seeds (x_1) and the cultivated area (x_2), which were influential on the obtained production (y). By the entire methodology, we aimed at knowing the evolutional tendency of intensifying the cultivating systems for the main cereals (wheat, barley, and maize).

OBTAINED RESULTS

*The importance of ensuring the seed system in Iraq.*In Iraq, the seed supply importance was acknowledged, ensured through the regulatory documents legitimation, permanently encouraging the good quality seeds use . A major development in the seed domain took place in 1968, when the government established the quantity of seed used by the farmer and determined that the seed quantities registration that are provisioned/used is a necessity. At the same time, in agriculture and the food service, a project for the seed production registration/supply[1] was initiated.

The most numerous seed entries destined to the production sector was observed at the same time with the increase in crop production. In Iraq, the agricultural research and development activity of plant varieties is considered an activity that pertains to the public sector and is centered on the strategic crops, but also on the vegetable ones. The National Committee for Registration and Release of Agricultural Varieties (NCRRAV)[2], through its attribution structure also comprises the product (seed) registration procedures and the legitimation mechanism that concern the following[3]: prior to the product registration and accreditation, it is necessary to describe the variety that is to be registered or approved, by including the most important phenotypical characteristics and the functional capacity or any other attributes that particularize it from other agricultural characteristics, for the same type. The descriptive documents that also include the product performance in the agricultural environment in relation to the local conditions;- presenting the attributes of plants biological and technological structures. There are knowledge references on the blooming and maturity periods, but also on the production level, the yield, the resistance to diseases and pests, the possibilities to introduce certain technological links (for example, mechanization), the qualitative characteristics, and so on.

Necessity to produce the seed material and the structure of the existent varieties in the crop zonal area in Iraq. Seed production is based on the varieties of the main cereal crops cultivated in Iraq (wheat, barley, maize) that can be presented in a structured manner by the following (most important)[4]:

a) Wheat varieties existent in crops by means of:

The coarse wheat, with its crop area focused in the country northern regions , particularly in Mosul, Kirkuk, Erbil, and Sulaymaniyah. It is usually based on the traditional agriculture and the Aldemah form (for which the crop uses only the rain water), what makes it less cultivated in the rest of the country. We may mention the following crop lines (articles): Oasis Iraq / ACSAD / M for spring etc; The wild wheat, with its crop area focused in the central areas of Iraq (the most productive provinces are Wasit (Kut), Diwaniyah, Najaf - where it is cultivated towards the end of the rice season) and in the northern regions for the Wiczra varieties (in this area frequently fall the short rains). The crop lines (articles) using the wild wheat are the following: Iraq / 99, Abu Ghraib / Maxibak, Knight, Rabia, Adnaniyah, Hashemite, etc.

b) Barley varieties can be rendered by the following crop lines (articles): six-row barley, represented by: Urban (black) - Warka (black) - Bawadi (black) – (parents of white 265), Samir (white), Norma (white), Riemann (white), and so on;

Table 1. Number of varieties and hybrids approved in the crops in Iraq

Specification	*)1991-1998	1992-2004**)	Differences	
	number	number	number	%
Wheat	24	34	10	141.7
Barley	16	19	3	118.8
Rice	4	8	4	200.0
Maize	9	12	3	133.3
Sorghum	1	3	2	300.0
Chickpea	1	-	-1	-
Lentil	2	1	-1	50.0
Soy	1	2	1	200.0
Phaseolus beans	1	-	-1	-
Sunflower	5	9	4	180.0
Triticale	1	1	0	100.0
Flax seeds	1	-	-1	-
Sesame	3	3	0	100.0
Rapeseeds	1	3	2	300.0
Vegetables	43	32	-11	74.4
Cotton	1	3	2	300.0
Tobacco	1	4	3	400.0
Fruit trees	3	-	-3	-
Sugar beet	-	1	1	-
Total	118	135	-	114.4

*)Awad Issa Abbas, The Seed Industry in Iraq, IPA Agricultural Research Center, P.O. Box 39094, Abu Ghraib, Baghdad; **)NAKD A. KHAMIS dr., 2005, AGRICULTURE IN IRAQ GENERAL VIEW, Aleppo, Syria

c) Maize varieties existent in the crops depend on the appropriate varieties import. The maize predominant varieties are those adopted in 2009, which are the following: Hybrid (maize), Synthetic (maize), Structural pleasure (maize). At present, the research sector for the maize seed production in Iraq has also introduced the Hmak variety.

As regards the varieties and hybrids number approved in the crops, table 1 shows their structuring for the periods 1991-1998 and 1992-2004, as follows:

On the overall crops, we can determine a growth in the varieties and hybrids number in 1992-2004, compared to the 1991-1998 period, this growth being of +14.4%.

The vegetables crops hold the greatest number - 43 (in the 1991-1998 period) and 32 (in the 1992-2004 period); this number of varieties is decreasing;

The cereals hold the greatest number for varieties and hybrids (this group comprises wheat, barley, rice, maize, sorghum), the highest percentage pertaining to the wheat, barley, and maize group, with a number of 49 varieties in the 1991-1998 period, and 65 varieties in the 1992-2004 period.

For the other crops, the cultivated varieties and hybrids number is insignificant, but it is remarkable that in some crops, the first period varieties (1991-1998) were completely abandoned in the next period (1992-2004). It's also the case for crops of chickpea, lentil, beans, flax seeds, and fruit trees. It is also remarkable the appropriate variety introduction in the sugar beet crop (in the 1992-2004 period), which did not exist in the previous period.

It is safe to infer that the cereal crops varieties hold the highest percentage, next to the tendency to amplify/renew these varieties.

Cultivated areas and seed production in Iraq. The areas cultivated with cereal also represent/impose a necessary level of the seed quantities. In *table 2*, we rendered the seed quantities, as a production crops areas result, whereby we can conclude the following: the straw cereals represented by wheat and barley also comprise the highest quantities of seeds: for maize, the surface and the seed quantity per hectare is much smaller, which is why the necessary quantity is much lower.

Table 2.- Cultivated area (ha) and necessary seed quantities (tons) for the main crops in Iraq (1995).

Crop	Area	Necessary quantity per ha	Necessary seeds (total)
	thousand ha	kg/ha	thousand to
Wheat	1535	100	154
Barley	1389	100	139
Rice	175	120	21
Maize	75	32	2
Total	3174	-	316

Source: Awad Issa Abbas, The Seed Industry in Iraq, IPA Agricultural Research Center,P.O. Box 39094, Abu Ghraib, Baghdad (Organization for Food and Agriculture FAO FAO, 1995).

For this reason, the level of seed production in wheat and barley was still tackled for the main production organization during the production periods 1996/1997, 1997/1998, 1998/1999. The analysis was rendered in a structural manner for the pre-basic seed (S), the basic seed (B), and the certified seed (C). For the structure of the production organization, the obtained quantities are rendered in *table 3*, whereby we can stress the following:

The Agricultural Research Institute (IPA), comprising the agricultural research centers (ARC), produce seed from all the three categories (S, B, C), but where the pre-basic seed (S) is predominant. In the three years dynamic, compared to the national total, we can note that IPA represents the lowest level, with a visible tendency to drop;

The Technological Seed Center produces seed from all categories (S, B, C), but very differentially. Thereby: in the 1996/1997 production year, the greatest seed quantity was the one included in the certified seed (C), while in the next years this category is no longer produced, and the quantities for the other categories are on the rise. Thereby: in the 1996/1997 production year, we determined that the greatest seed quantity was the one included in the certified seed (C), while in the next years this category is no longer produced, and the quantities for the other categories are on the rise. The Mesopotamia and Iraqi Seed Companies produce the greatest quantities of seed at a national level (cumulatively, these companies represent between 90.47% and 93.09% compared to the national total).

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Table 3. Production of wheat and barley seeds (tons) between 1996/1997 – 1998/1999 (thousand tons)

Organisation	1996/1997				1997/1998				1998/1999			
	S	B	C	Total	S	B	C	Total	S	B	C	Total
IPA-ARC	305	797	467	1568	211	44	34	289	136	36	-	172
Technological Seed Center	323	194	1067	1584	602	-	-	602	561	1435	-	1996
Mesopotamia Seed Company	83	14	3854	3952	79	2297	9385	11761	-	312	3241	3553
Iraqi Seed Company	142	448	14998	15588	14	4711	19349	24074	66	2684	22904	25654
Total	853	1453	20386	22692	906	7052	28768	36726	763	4467	26145	31375

S –pre-base; B=base; C=certified

But the evolution of the seed levels for the three years (expressed in %) is registered as follow: *a)* a decrease registered by the Mesopotamia Seed Company (the decrease in the 1998/1999 year, compared to the 1996/1997 year is of –10.10 %); *b)* a significant growth registered by the Iraqi Company for Seed Production (the 1998/1999 year compared to the 1996/1997 year, when we determine an increase by + 64.57 %). A characteristic of these companies is the production of very high quantities of certified seed (C). It results that for Iraq, the seed quantities origin is differentiated quantitatively, as well as qualitatively, and the most significant annual levels are attributed to Iraqi Company for Seed Production, and for IPA-ARC and the Technological Center for seed we determine annual drops.

The used seed quantities represent the comparing side for the seed quantities use, a reason for which the specialists have aimed at knowing the use level in the last two decades (the dynamics of the 1990-2010 years). The level of these quantities has been analyzed by annual comparison, in an evolutional manner through the total quantities and per the hectares used for wheat, barley, and maize. The total seed quantities evolution renders in table 4, for wheat, barley, and maize, the annual levels by comparisons towards 1990 and 2000, which allows us to conclude the following:

The seeds quantities increasing tendency for wheat crops (from 261768 thousands tons in 1990 to 550000 thousands ton in 2010). The increase is also significant by comparing the 2010 year's levels to the 1990 ones (+110.1%), but also ti the 2000 ones (when the increase was of +147.3%). There are also decreases registered in the years 1995 and 2000, but the tendency is to grow;

Table 4. Evolution of total seed quantities used in wheat, barley and maize crops between 1990 and 2000 in Iraq

Specification	MU	1990	1995	2000	2005	2007	2008	2009	2010
Wheat	tons	261,768	156,000	222,358	432,000	408,000	270,000	350,000	550,000
	Compared to 1990(%)	100.0	59.6	84.9	165.0	155.9	103.1	133.7	210.1
	Compared to 2000(%)			100.0	194.3	183.5	121.4	157.4	247.3
Barley	tons	241,207	165,000	168,700	177,800	210,000	140,000	140,000	140,000
	Compared to 1990(%)	100.0	68.4	69.9	73.7	87.1	58.0	58.0	58.0
	Compared to 2000(%)			100.0	105.4	124.5	83.0	83.0	83.0
Maize	tons	4,702	2,800	4,400	7,600	6,000	5,400	5,400	5,400
	Compared to 1990(%)	100.0	59.5	93.6	161.6	127.6	114.8	114.8	114.8
	Compared to 2000(%)			100.0	172.7	136.4	122.7	122.7	122.7

Source: State FAO, http://faostat3.fao.org/home/index.html#DOWNLOAD_STANDARD

For barley, we note a drop of the total quantities for used seed, registering in 2010 a decrease to the level of -42.0% (compared to 1990) and -17% (compared to 2000);

The seed quantities for the maize crops signal annual variations, but with a growing tendency (the maximum of the used quantities is registered in 2005 and 2007). The year 2010 level comprises an increase by +14.8% compared to 1990, and by +22.7% compared to 2000. The seed quantity used on the area unit represents the analysis qualitative side of the seed uses, which represents a production system important link, whereby using the data rendered in table 5 we can conclude the following: For wheat, the seed quantities per hectare register annual variations. The lowest quantities are determined for the 1995-2005 period, followed by growths. The 2010 level is of +79.3% compared to 1990 and of +114.6% compared to 2000, the period overall tendency being of growth;

For barley, the same fluctuation of the quantities was noted for the years 1995 and 2008, with a slight tendency for growth compared to 1990 (the 2010 level being of +10.9%), but also with a drop compared to 2000 (the 2010 level is diminished by -8.4%); For the maize crop, the oscillations of the quantities of seed consumed per hectare comprise maximum level in 1990 and 2000, followed by variations in the final years of the period between 44 and 48 kg/ha. The comparison of 2000 to 1990 indicates a drop by -29.6%, and compared to 2000, the drop is of -21.9%. All these seed usage variations, total and per hectare, reflect the evolutional tendency to intensify the crop systems for the main cereals (wheat, barley, and maize), rendered in particular by the restructuring of the cultivated varieties/hybrids.

Table 5.- Evolution of total seed quantities per hectare in wheat, barley and maize crops between 1990-2010 in Iraq

Specification	MU	1990	1995	2000	2005	2007	2008	2009	2010
Wheat	Kg/ha	222	102	185	169	260	188	277	398
	Compared to 1990(%)	100.0	45.8	83.6	76.4	117.2	84.8	125.0	179.3
	Compared to 2000(%)	-	-	100.0	91.4	140.3	101.5	149.6	214.6
Barley	Kg/ha	125	119	152	167	192	104	199	139
	Compared to 1990(%)	100.0	94.7	121.1	133.3	153.0	82.7	158.6	110.9
	Compared to 2000(%)	-	-	100.0	110.0	126.3	68.3	130.9	91.6
Maize	Kg/ha	68	44	60	44	39	44	47	48
	Compared to 1990(%)	100.0	65.5	89.1	64.4	57.0	64.9	69.8	70.4
	Compared to 2000(%)	-	-	100.0	72.3	64.0	72.8	78.3	79.0

Source: State FAO,http://faostat3.fao.org/home/index.html#DOWNLOAD_STANDARD

There are also a great number of obstacles that prevent the development of a seed sector for the national sector. These restrictions are especially manifested for the agricultural research domain, but also in the product development. Correlations and predictable limits between the results and the production agricultural capacities for the main cereal crops in Iraq.The multitude of factors involved in the results of the agricultural production level impose, on the one side, the knowledge of these factors' structure, of the intensity of their influence, and, on the other side, a prediction that can be quantified by a forecasting demarcation for the three crops (wheat, barley, and maize).

For *the wheat crop*, the data in *table 6*, having determined **the function** $Y(\text{thousands tons})=0{,}00001 \cdot X_1^{1{,}329923} \cdot X_2^{0{,}906608}$ and the graphical representations in *fig. 1* illustrate specific aspects that can be highlighted as it follows:

By extrapolating the seed quantity factor (x_1) by +1 % (that is, 550+5,5=555,5 thousand tons), and x_2 being constant, Y is growing from 1759.0 to 1782.4 thousand tons (that is with +23.4 thousand tons, representing 1.329%); Extrapolating the factor expressing the cultivated area (x_2) by +1%, (that is, 1396.83+13,83 = 1396,83 thousands ha), ; x_1 being constant, Y is growing from 1759.0 to 1774.9 thousand tons, that is with +15.9 thousand tons, which represents 0.906 %; In the situation where the two factors have an increase of 1%, respectively the seed quantity grows from 555.5 thousand tons.

Tthe area to 1396.83 thousands ha, it is possible to obtain a total production of 1798.5 thousand tons, that is a growth of +39.6 thousand tons, which in percentages represents a 2.25% augmentation, representing the sum of the two factors' growth. From the analysis of the determination coefficient, we can remark that the augmentation of the wheat production level (y) is due to the seed factor with 54.52% and to the area factor with 9.19%, and other factors representing 36.29%. The multiple correlation coefficient is $r_{x1,x2}$ =0.798, which means a powerful correlation between the production and the two factors.

Table 6.- Function of wheat production, between seed quantity (x_1) and area (x_2), in Iraq, between 2000 and 2010

Year	Wheat			
	Seed quantity	Area	Total prod	Total adjusted prod
	X_1 (thousand to)	X_2 (thousand ha)	y (thousand to)	Y(thousand to)
2000	222	1200	384	463,1
2001	280	1220	903	639,9
2002	300	1649	2589	921,7
2003	300	1714	2329	954,6
2004	405	1540	1832	1291,0
2005	432	2550	2228	2222,0
2006	448	1514	2086	1453,7
2007	408	1570	2203	1326,7
2008	270	1435	1255	706,4
2009	350	1262	1700	887,7
2010	550	1383	2749	1759,0

Own calculations

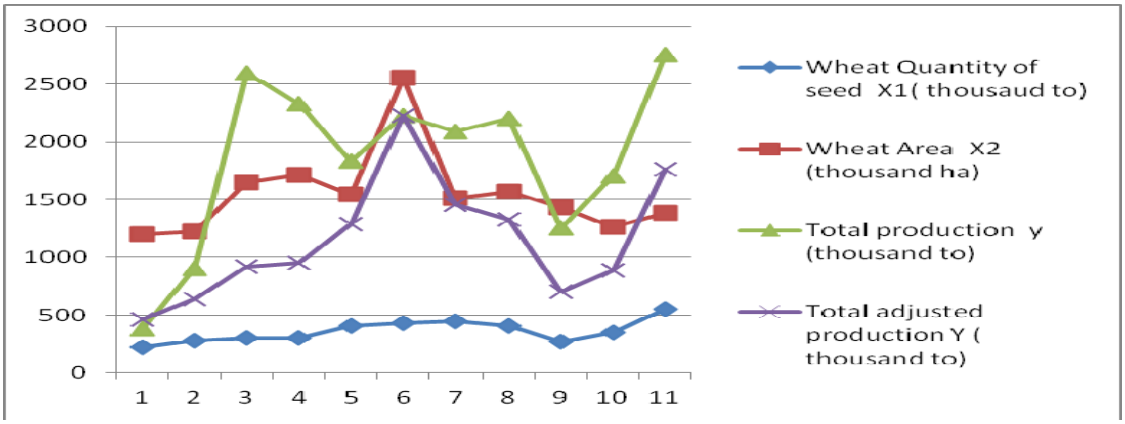

Fig. 1. **Variations of the production factors (x_1, x_2) and the productions (y), resulted from the regression equation.**

For *the barley crop*, according to the data in *table 7* was determined the following function:
Y(thousands to)= 53,177 $\cdot X_1^{0,8067402} \cdot X_2^{-0,22378}$, according to the variations of the factors x_1 and x, tendered in *table 3.42* and represented graphically in *fig. 2*. For the x_1 and x_2 factors, successive and cumulated variations were performed, which led to the following points of view:
The extrapolation of the seed quantity factor (x_1) by +1 % (that is, 140+1.4=141.4 thousands tons), and x_2 being constant, we determine that the (Y) production is growing from 609.8 to 614.7, that is, by +4.9 thousands tons, which is 0.805% in percentages;

The extrapolation of the cultivated area factor (x_2) by +1%, (that is, 1006+10.06 = 1016.06 thousands ha), situation where x_1 remains constant, the production (Y) is decreasing from 609.8 to 608.4 thousands tons, that is a -1.4 thousands tons decrease, which represents -0.22 %;

Table 7.- Function of barley production, between seed quantity (x_1) and area (x_2), in Iraq, between 2000 and 2010

Year	Barley			
	Seed quantity	Area	Total prod	Total adjusted prod
	X_1 (thousand to)	X_2 (thousand ha)	y (thousand to)	Y(thousand to)
2000	169	1110	400	694,3
2001	182	1200	550	724,4
2002	177	1300	1032	695,7
2003	178	1063	861	731,1
2004	178	957	805	748,4
2005	178	1063	754	731,1
2006	178	1026	919	736,9
2007	210	1094	748	830,0
2008	140	1349	404	571,0
2009	140	704	502	660,5
2010	140	1006	1137	609,8

Own calculations

The situation where the two factors (x_1 and x_2) register a 1% growth, the total production of 613.3 thousands tons is obtained, that is an augmentation by +3.5 thousands tons, which in percentages is a 0.58% growth, a level that cumulatively renders the sum of the two factors' increase.

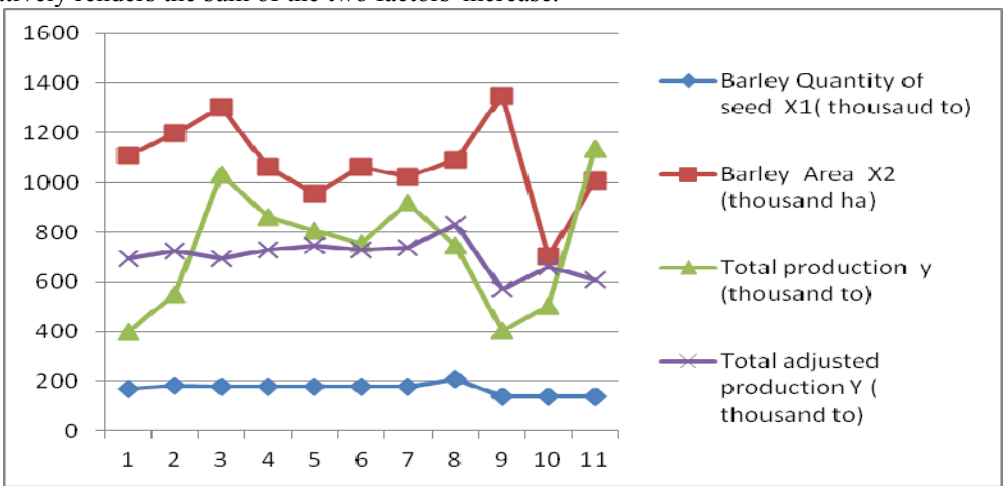

Fig. 2. **Variations of the production factors (x_1, x_2) and the productions (y), resulted from the regression equation..**

From the analysis of the determination coefficients, we can remark that the increase tendency of the barley production, which is due to the seed factor with 6.92% and to the area factor with 1.06%, and other factors representing 92.01%.

The multiple correlation coefficient is $r^{x1,x2}$ =0.28, a situation where we may state that there is an explicit correlation between the production and the two factors, these remaining relatively constant throughout the analyzed period.

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Table 8.- Function of maize grains production, between seed quantity (x_1) and area (x_2), in Iraq, between 2000 and 2010

Year	Maize grains			
	Seed quantity	Area	Total prod	Total adjusted prod
	X_1 (thousand to)	X_2 (thousand ha)	y (thousand to)	Y(thousand to)
2000	4	73	55	107,7
2001	5	98	232	175,0
2002	4	102	248	173,2
2003	8	95	233	192,6
2004	8	185	416	496,3
2005	8	174	401	454,9
2006	8	165	399	421,9
2007	6	155	384	354,2
2008	5	123	288	241,6
2009	5	144	238	302,2
2010	5	113	267	214,2

Own calculations

The situation of *the maize grains* was analyzed through the same system of the exponential production function, that is, Y (thousands to)=0.161 $\cdot x_1^{0,2987311} \cdot x_2^{1,419884}$, for which the variations of the influential factors were applied (x_1 and x_2**)**. This function was determined based on the data in *table 8*, to which is added the trend represented by the curve form rendered in *fig. 3.* It is possible to state the following:

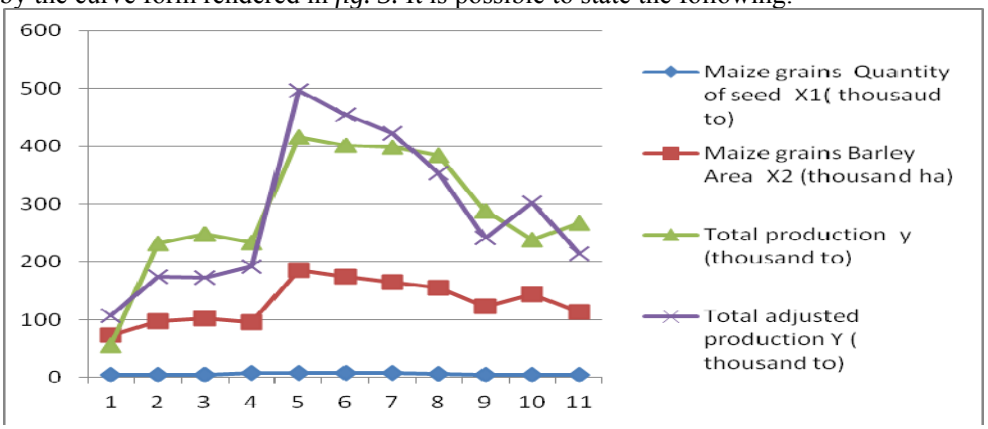

Fig.3. Variations of the production factors (**x_1, x_2**) and the productions (y), resulted from the regression equation.

The extrapolation of the seed quantities level (x_1) by +1 % (that is, 5.0+0.05=5.05 thousands tons), and with x_2 constant, we determine that the (Y) production is growing from 214.2 to 214.8, that is, by +0.6 thousands tons, which is 0.298%;

The extrapolation of factor expressing the cultivated area (x_2) by +1%, (that is, 113+1,13 = 114,13 thousands ha), ; x_1 being constant, we determine a production (Y) growth from 214.2 to 217.2 thousands tons, that is by +3.0 thousands tons, which represents 1.419 % in percentages;

- the situation where the two factors (x_1 şi x_2) have a simultaneous increase of 1% (that is, the seed quantity to 5.05 thousands tons, and the area to 114.13 thousands ha), it is possible to obtain the total production (y) of 217.9 thousands tons, that is a growth of 3.7 thousands tons, which in percentages represents a 1.717% augmentation, representing the cumulated sum of the two factors.

From the determination coefficients analysis, we can remark that the maize production increase tendency is due to the seed factor by 41.02% and to the area factor by 31.2%, other factors representing 27.77%. The multiple correlation coefficient is $r_{x1,x2} = 0.28$, a situation for which we can state that there is no explicit correlation between the production and the two factors, these remaining relatively constants throughout the analyzed period.

CONCLUSIONS

The seed production is based on the varieties of the main cereal crops cultivated in Iraq. The cereal crops varieties hold the highest percentage, next to the tendency to augment/renew these varieties (wheat, barley, maize grains). The area cultivated with cereals also represent/impose a necessary level of the seed quantities, as a result of the production crops areas, among which: the straw cereals represented by wheat and barley also comprise the highest quantities of seeds; for maize, the surface and the seed quantity per hectare is much smaller, which is why the necessary quantity is much lower. The origin of the seed quantities is differentiated quantitatively, as well as qualitatively, and the most significant annual levels are attributed to Iraqi Company for Seed Production, and for IPA-ARC and the Technological Center for seed we determine annual drops. The seed quantity used on the total area and on the area unit (representing the qualitative side) actually constitutes an important link in the production system , reflects the evolutional tendency to intensify the cultivating systems for the main cereals (wheat, barley, and maize), particularly rendered by the restructuring of the cultivated varieties/hybrids. The multitude of the factors involved in the results of the agricultural production level stresses the intensity of their influence, and on the other side it creates the possibility of a prediction that can be quantified by a forecasting demarcation for the three crops (wheat, barley, and maize). The forecasting correlations and boundaries between the agricultural results and capacities highlight specific aspects that can be emphasized as follows: *a)* for wheat and barley, the growth of the seed quantity (x_1) is of utmost importance for the augmentation of the production (y). At the same time, the multiple correlation coefficient for wheat suggests a powerful correlation between the production and the two factors, and for barley there is no explicit correlation between the production and the two factors, these remaining relatively constants throughout the analyzed period; ***b)*** the maize grains represents an increase of the production at the same time with the augmentation of the production factors. The multiple correlation coefficient renders the situation by which we can state that there is no explicit correlation between the production and the two factors, these remaining relatively constants throughout the analyzed period.The fluctuations of the productions are mainly conditioned by the climatic factors and the poor financial funding of the small sustenance farms. But one of the conditions necessary to stimulate the performances of this maize grains consists in the use in seeding of quantities of seed with a high maize grains value, a high degree of biological purity, from the most competitive varieties that are recommended.

The strategies in the Iraq i seed sector monitor the breeding and development of new varieties, as well as their supervision by means of the introduction and examination through incubators for evaluation and selection of types of genes that can be adopted and adapted to the country's climatic conditions. There are also a great number of obstacles that prevent the development of a seed sector for the national sector. These restrictions are especially manifested for the agricultural research domain, but also in the product development.

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