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An Economic and Econometric Comparative Study of Some Local Wheat Varieties with Imported Ones Planted in Salah al-Din Governorate for the Agricultural Season 2022/2023 (Tikrit District - an Applied Model)

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ABSTRACT

The study aimed primarily to measure the impact of using varietal technology on increasing the productivity of a dunum of wheat for the agricultural season 2022/2023, by studying the productivity and profitability indicators of the wheat crop, including analyzing the reality of the costs of producing the wheat crop, Determining the amount of increase in production through the use of high-yielding (imported) varieties to replace low-yielding (local) varieties, as well as the amount of total returns and net profit, in addition to estimating the production function for local wheat varieties and imported wheat varieties, In collecting its data, the research relied on a random sample of wheat farmers in Salah al-Din Governorate/Tikrit District, consisting of 80 farms for local wheat farmers and (60) farms for imported wheat farmers. The results of the research showed that the average production per dunum of imported wheat for the studied varieties was around (1167.25). Kg and the average production per dunum of local wheat for the studied varieties is approximately (770.83) kg, While the average total return per dunum in local wheat was around (655,203.6) dinars/dunum, and in imported wheat, it was around (992,162.5) dinars/dunum. As for the average net profit per dunum, it was around (310,567.9) dinars/dunum for local varieties and around (547,781.1) dinars/dunum for varieties. imported, the research results also showed that the estimated production function for local wheat varieties and imported varieties to the total capacity returns are (0.576, 0.805) respectively, and this indicates decreasing capacity returns, which means that increasing the use of production resources by 1% leads to an increase in wheat production for the varieties. local by (0.576) and to increase wheat production for imported varieties by (0.805), And all producers work in the second stage of the production stages of the law of diminishing returns, which is the rational production area. Therefore, the study recommends working to improve and develop the quality of local seeds, and this is done through selection and hybridization processes, because most of the local varieties have deteriorated due to neglect and lack of care for them by farmers.

1. Introduction

Wheat, scientifically known as Triticum aestivum, is the most widely grown crop in the world. It forms the staple food of human nutrition, directly supplying more nourishment to the population than any other food. It is mainly composed of bread and is used as a major ingredient by various food industries.

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Wheat is a strategic major crop in Iraq and is considered the main food supply. Wheat production in Iraq is relatively low compared to its natural and human resources and to most neighboring countries. Productivity in Iraq has fallen increasingly behind that of the region owing mainly to inappropriate agricultural policies and, of more priority, the scarcity of water resources and inadequate research support for developing local wheat varieties. Iraq has faced challenges in meeting increasing demand for wheat, driven primarily by adverse population dynamics and the ineffective strategy in the agricultural sector. This has led to more imports of wheat, putting additional pressure on the trade balance of the country. The varying rate of self-sufficiency in wheat indicates that much is required in improving agricultural practices and resource management to minimize the distinction between what is produced and what is consumed. In particular, the high-yielding wheat varieties are perceived as one major aspect of productivity growth. Therefore, bred or imported varieties, with more potential for high yields, have come into existence as practical resolutions that can fill up the wheat deficit and increase self-sufficiency. This corresponds to the assumption of this paper: through the adoption of this sort of wheat technology, Iraq can raise wheat production to a significantly higher level and reduce the reliance on imports. Research on the effectiveness of different strains and their adaptability in Iraq's climate and soil conditions forms an essential research step toward surmounting wheat production difficulties (Mouhamad et al., 2014; ALAZZAWI et al., 2024).

Another issue central to the agriculture sector in Iraq is seed quality. The low quality and insufficient supply, coupled with very expensive imported seeds, are major constraints of adopting more productive wheat varieties by the farmers. This, coupled with the general decline in agricultural productivity in Iraq, calls for an intensive analysis of seed technology and the choice of varieties. Research in analogous fields has revealed that the environmental aspect, particularly saline and arid conditions, greatly affects crop output. For a similar case, reports of studies regarding mechanisms of salt tolerance among rice genotypes and how drought negatively impacts other crops would contribute much to the management of agriculture during unfavorable conditions (Mouhamad et al., 2012; Mouhamad et al., 2020; Mouhamad et al., 2024). This is an indication that such findings will help realize where the constraints are and work toward the betterment of wheat yield in Iraq.

Study Objectives

- Impact of Varietal Technology on Wheat Productivity: Evaluating how the adoption of modern high-yielding varieties affects the productivity of wheat crops (dunum).
- Wheat Production Costs Analysis: Analyzing production costs and revenues in Salah al-Din for the 2022/2023 season to derive profitability indicators.
- Comparing High-Yield Varieties to Low-Yield Varieties: Estimating the increase in wheat production from using high-yielding imported varieties over local varieties.
- Profitability of Varieties: Assessing the profitability of different wheat varieties.
- Production Function Estimation: Comparing the production functions of local versus imported wheat varieties.

2. The previous studies

There are many research and studies that have dealt with this topic. In this regard, there is a study conducted by Muhammad (2016) to evaluate the impact of using varietal technology on wheat

production. The research aimed to measure the effect of using modern varieties on increasing the productivity of an acre of wheat and determining the amount of increase in production through... Replacing low-yielding varieties with high-yielding varieties. The results of the research showed the superiority of certain varieties over other varieties by replacing them. The research recommends the need for farmers to adopt the application of technology for high-yielding varieties to reduce the gap between production and consumption, and in 2017 Qassem and others completed a study entitled the economic efficiency of the most important wheat varieties grown in Alexandria Governorate. The research aimed to measure some productive and economic indicators associated with the production of the cultivated wheat crop varieties and estimate the economic efficiency of the production of the cultivated wheat varieties to identify the production costs that can be reduced to achieve the same level of production, as well as measuring The economic impacts resulting from achieving efficiency in the production of cultivated wheat varieties by estimating the losses resulting from the lack of technical efficiency and the possibility of reducing production costs, The research reached a focus on cultivating varieties with high economic efficiency in the research area and continuing the role of research centers in developing and cultivating new varieties in pilot fields that tolerate climate change and are resistant to diseases, in order to use improved, high-yielding varieties, and exclude varieties whose ability to resist diseases has weakened, in the year 2020, researcher Daham completed a study entitled (An economic analysis of the impact of modern technologies in improving wheat productivity in Iraq), the National Program for the Development of Wheat Agriculture in Babil Governorate. The study aimed to analyze the economics of the package of modern agricultural technologies applied by the program to farmers, and the results of the analysis showed CBA returns costs. The net returns (N. R) in the event of using these technologies amounted to approximately (393,932) dinars/dunum, which is higher than the net returns without using them, which amounted to approximately (239,760) dinars/dunum, with an increase rate of (64%), which indicates achieving profits for farmers from among the package of technologies. The study recommends the need to pay attention to the technical aspect and modern innovations to improve production quantities and agricultural productivity rates to reach self-sufficiency.

In 2022, Al-Sayed presented a study entitled The Economic Impact of Adopting Improved Recommendations on Wheat Production in Egypt. The study attempted to answer questions such as: What are the economic impacts of using the improved varieties recommended by the National Campaign to Start Wheat Production (NCUWP). The results of the study showed that about (71%) of the changes in wheat production are due to changes in the quantities of seeds, organic fertilizers, nitrogenous and phosphorous fertilizers, labor, and mechanical work.

3. Research materials and working methods

The primary (sectional) data was collected from hot and personal sources for the crop farmers through a modern questionnaire form prepared for this harvest. The total number of questionnaires was (140) questionnaires for the farmers who used irrigation systems. The number of questionnaires for local cuisine categories was (80) questionnaires for the study population, and by (30) forms for growers of the medicinal crop, variety (Eba99), (30) forms for growers of the medicinal crop, variety (Sham 6), and (20) forms for growers of the medicinal crop, variety (Buhoth 22), While the number of questionnaires for imported wheat varieties is (60) from the studied community, with (20) questionnaires for farmers

of the wheat crop variety (Ozkan), (20) forms for farmers of the wheat crop variety (Ceyhan), and (20) forms for farmers of the wheat crop variety (Faithful) from the total sample farmers in Salah al-Din Governorate, Tikrit District, for the agricultural season 2022/2023. As for the secondary (office) data, it was obtained through official sources in the Salah al-Din Agriculture Directorate, in addition to methodological books, theses, theses, and magazines. As for the analysis method, descriptive and quantitative statistical analysis tools were used to achieve the objectives of the study, such as averages, percentages, simple and multiple linear regression, and using different mathematical formulas to extract the most important statistical and measurement indicators using (Excel) and (Eviews 12) programs to reach logical and moral results that meet economic standards. And statistics and measurement. The average percentages of fixed and variable costs were calculated from the total cost of local wheat and imported wheat according to the tables 1.

Table 1. Average percentages of contribution of variable and fixed cost items to the total costs of (local) wheat production in Salah al-Din Governorate (Tikrit District)

Variable cost items	Relative importance %	Fixed cost items	Relative importance %
Land preparation	6.71	Family work	2.31
Seeds	9.91	Extinction	24.05
Urea and compound fertilizer	21.58	land rent	1.44
Pesticides and control	9.39		
Electricity and fuel	8.49		
Maintenance work	2.75		
Harvest	5.59		
Transport and Marketing	5.34		
Hired labor	0.32		
Transaction fees	1.44		
Total variable cost	72.19%	Total fixed cost	27.81%

Source: Authors (Analysis conducted by the researcher based on the data of the questionnaire form using the Eviews 12 program).

From Table No. (1), which represents the average percentages of the contribution of variable and fixed costs to the total costs of local wheat production in Salah al-Din Governorate (Tikrit District), it is clear that the relative importance of the variable costs to the total costs was approximately (72.19)%, of which seed costs constituted what Its percentage was (9.91)%, while the relative importance of fixed costs to total costs was around (27.81)%, while in Table No. (2), which represents the average percentages contribution of variable and fixed cost items to the total costs of imported wheat production in Salah al-Din Governorate (Tikrit District).

Table 2. Average percentages of contribution of variable and fixed cost items to the total costs of (Imported) wheat production in Salah al-Din Governorate (Tikrit District)

Variable cost items	Relative importance %	Fixed cost items	Relative importance %
Land preparation	5.83	Family work	2.10
Seeds	17.26	Extinction	19.08
Urea and compound fertilizer	21.63	land rent	1.12
Pesticides and control	7.72		
Electricity and fuel	10.27		

Variable cost items	Relative importance %	Fixed cost items	Relative importance %
Maintenance work	2.75		
Harvest	5.49		
Transport and Marketing	5.24		
Hired labor	0.38		
Transaction fees	1.12		
Total variable cost	77.69 %	Total fixed cost	22.31 %

Source: Authors (Analysis conducted by the researcher based on the data of the questionnaire form using the Eviews 12 program).

It was found that the relative importance of the variable costs to the total costs was approximately (77.69) %, of which seed costs constituted (17.26) %, while the relative importance was Fixed costs to total costs are approximately (22.31) %, and the high percentage of variable costs is due to the high percentage of imported seed costs.

As for Table No. (3), which shows us the average production per dunum, the average total revenue per dunum, the average total costs per dunum, and the average profit per dunum for all the category's studied, from this it is clear that the highest average production of imported varieties is achieved by the Ozkan variety, which amounts to approximately (1227.75) kg per dunum, and the highest average production is for the distinctive local varieties, the (Ibaa 99) variety, which is known to be around (845.36) kg per dunum, but the lowest average production is for the imported varieties, the (Ebaa 99) variety. (Wafiya), which amounts to (1102.5) kg per dunum, and the lowest average production of the distinctive local varieties (Al-Buhoth 22), which amounts to (670.25) kg per dunum,

Table 3. Average production per dunum, average total revenue per dunum, average total costs per dunum, and average profit per dunum

Sequence	Category	Average productivity per dunum (kg)	Average total revenue per dunum (dinar)	Average total costs per dunum (dinar)	Average profit per dunum (dinar)
1	Ebaa 99	845.36	718554.58	355883.58	362671.00
2	Sham 6	796.88	677343.75	341659.25	335684.50
3	Research 22	670.25	569712.50	336364.25	233348.25
4	Average Local	770.83	655203.6	344635.70	310567.9
5	Wafya	1102.50	937125.00	439441.00	497684.00
6	Jihan	1171.50	995775.00	444303.20	551471.80
7	Ozkan	1227.75	1043587.50	449400.13	594187.38
8	Average import	1167.25	992162.5	444381.10	547781.10

Source: Authors (Analysis conducted by the researcher based on the data of the questionnaire form using the Eviews 12 program).

As for Table No. (3), which shows us the average production per dunum, the average total revenue per dunum, the average total costs per dunum, and the average profit per dunum for all the category's studied, from this it is clear that the highest average production of imported varieties is achieved by the Ozkan variety, which amounts to approximately (1227.75) kg per dunum, and the highest average production is for the distinctive local varieties, the (Ibaa 99) variety, which is known to be around (845.36) kg per dunum, but the lowest average production is for the imported varieties, the (Ebaa 99) variety. (Wafiya), which amounts to (1102.5) kg per dunum, and the lowest average production of the

distinctive local varieties (Al-Buhoth 22), which amounts to (670.25) kg per dunum, While the average production per dunum of imported wheat for the studied varieties was around (1167.25) kg, and the average production per dunum of local wheat for the studied varieties was around (770.83) kg. As for the average total costs per dunum, it was approximately (344,635.7) dinars/dunum for local wheat and approximately (444,381.1) dinars/dunum for imported wheat. From this we note that the percentage increase in costs was approximately (28.94%). While the average total yield per dunum in local wheat was approximately (655,203.6) dinars per dunum, and in imported wheat, the average total yield per dunum was approximately (992,162.5) dinars per dunum, and this difference is due to the high dunum productivity of the imported varieties compared to the local varieties. As for the average net profit per dunum It was about (310567.9) dinars/dunum for local varieties and about (547781.1) dinars/dunum for imported varieties. From these numbers we notice the large gap in the amounts obtained from profits per dunum, which in this study amounts to about (76.38%), which is attributed to the large difference. In production per dunum between local wheat and imported wheat.

4. Results and discussion

The Cobb-Douglas production function was adopted, which consists of the two components of production (labor, capital) in its exponential form:

$$Y= AL^{b1}k^{b2}$$

as:

Y = total output.

A = state of technology.

L, K = quantities of factors of production (labor and capital).

b_1, b_2 = production elasticities of the two components of production (labor and capital), It has a positive sign and its value is less than one, as b_1 is labor's share of production and b_2 is capital's share of production (Lodewijks & Monadjemi, 2016: 40).

The Cobb-Douglas function in double logarithmic form is as follows:

$$\ln Y = \ln A + b_1 \ln L + b_2 \ln K$$

The production function was estimated by analyzing the data using the least squares method, and the double logarithmic formula was adopted as the best formula in representing the model for the relationship between production as a dependent factor on the one hand and labor and capital on the other hand as independent factors.

Table 4. Outputs of the results of the production function analysis for local and imported wheat varieties in Salah al-Din Governorate/Tikrit District

Sequence	Type of wheat	Cobb-Douglas production function	D.W	R^2	F
1	Local	Y=3.635+ 0.117 L+ 0.459 K t (8.76) (4.27) (6.66)	1.73	0.69	86
2	Importedd	Y=2.318+ 0.104 L+ 0.701 K t (2.67) (7.03) (13.13)	1.83	0.81	128

Source: Authors (Analysis conducted by the researcher based on the data of the questionnaire form using the Eviews 12 program).

From the first equation, which represents the estimated production function for local wheat varieties in Salah al-Din Governorate/Tikrit District, and based on the data of the table above, it is compatible with economic, statistical, and econometric logic, as follows:

From the economic analysis of the estimated function above, we conclude that the parameters of the estimated independent variables (labor and capital) are consistent with economic logic and are directly proportional to the dependent variable (production) because their signs are positive, and that the productive elasticities for both labor and capital were in the range of (0.117, 0.459), respectively, This means that whenever labor increases by 1%, production increases by (0.117%) with the capital resource remaining constant, and similarly, whenever the capital resource increases by 1%, production increases by (0.459%) with the labor resource remaining constant.

The fixed limit (A), with a value of 3.6, represents the technical level, as its value can be increased by using high-productivity varieties in addition to developing and improving work mechanisms.

The total returns to scale for the function estimated above amounted to about (0.576), which represents the sum of the partial production elasticities for both labor and capital suppliers and the sum of their values is less than the correct one. This means that the estimated production function for local wheat varieties indicates diminishing returns to capacity, and from this we conclude: Increasing the use of production resources by 1% leads to an increase in wheat production for local varieties by (0.576), and this case means that wheat farmers produce in the second stage of the production stages of the law of diminishing returns, which is the rational production zone.

Statistical Analysis

The (t) test resulting from the statistical analysis of the estimated function data showed the significance of the estimated parameters at the (1%) level, while the coefficients of the estimated function variables, namely labor and capital, were significant at the (1%) level. The F test also showed the significance of the function as a whole at Significance level (1%), While the value of the coefficient of determination (R_2 = 0.69) was shown to us, this explains to us that (69%) of the changes occurring in production are caused by changes occurring in the independent (explanatory) variables included in the model, which are (L, K), and that (31%) of These changes are due to other factors not included in the model.

Econometric analysis

A - Auto correlation problem for the random variable

The model showed that there is no problem of autocorrelation between the random variables after conducting the Durbin-Watson test (Koutsoyiannis, 1977), because the calculated value of the Durbin-Watson (D.W) test is equal to (1.732) for a significance level of 5%), This value falls within the range (du < D.w < 4-du), meaning its value is limited to (1.59 < 1.73 < 2.31), as the calculated D.w value is greater than du and smaller than 4-du, meaning it falls in the acceptance area (the decisive decision). From this we conclude that there is no autocorrelation between the random variables.

B - The problem of heteroscedasticity

Since the study relied on cross-section data, it is necessary to detect the problem of heteroscedasticity, As it is expected that there will be a problem of non-stationarity of homogeneity, the Park Johnston (1984: 568) test was used, which works to estimate the square error regression equation as a dependent variable of the (independent) explanatory variables in the model, which are L, K), and the estimated functions In double logarithmic form, as follows:

1- Error bound square Test for the explanatory variable Labor (L)

$$\ln ei^2 = a + b \ln L$$

$$\ln ei^2 = 0.0749 - 0.00948 \ln L$$

t (1.109) (- 0.993)

$$F = 0.98 \ , \ R^2 = 0.012$$

2- Error bound square Test for the explanatory variable Capital (K)

$$\ln ei^2 = a + b \ln K$$

$$\ln ei^2 = 0.321 - 0.0445 \ln K$$

t (3.16) (-3.10)

$$F = 0.906 \ , \ R^2 = 0.109$$

Since the estimated functions are not significant below the level of (5%) according to the (F) statistic, and as appears from the test results for the above models, because the calculated (F) value is much less than the tabulated (F), we conclude that there is no problem of heterogeneity of variance.

C - Multicollinearity problem

The problem of multiple linear correlation occurs when two or more independent variables are linked in a very strong linear relationship, so that it becomes difficult to separate the effect of each of the independent variables on the dependent variable. To detect the presence of the problem of multiple linear correlation between the independent variables, we do this through a partial correlation matrix. Simple differences between independent variables through the Klein Test (Maddala 1988:271-295).

The above simple correlation matrix shows that there is no problem of multiple linear correlation between the independent variables, because the simple correlation coefficient between the independent variables (L, K) has a value of (0.65), which is less than the value of the total correlation coefficient of the estimated model, which has a value of (0.83). Also, by comparing the coefficient of determination (R^2) with the square of the correlation coefficient between the independent variables, if the coefficient of determination (R^2) is greater than the square of the correlation coefficient between the independent variables, this means that there is no problem of multiple linear correlation.

Table 5. Klein Test on the Partial Correlation Matrix for Multicollinearity Detection

Matrix	L	K
L	1	0.650
K	0.650	1

Source: Authors (Analysis conducted by the researcher based on the data of the questionnaire form using the Eviews 12 program).

From the second equation, which represents the estimated production function for imported wheat varieties in Salah al-Din Governorate/Tikrit District, and based on the data of the table above, it is consistent with economic, statistical, and econometric logic, as follows:

From the economic analysis of the estimated function above, we conclude that the parameters of the estimated independent variables (labor and capital) agree with economic logic and are directly proportional to the dependent variable (production) because their signs are positive, and that the productive elasticities for both labor and capital were in the range of (0.104, 0.701), respectively, This means that whenever labor increases by 1%, production increases by (0.104%) with the capital resource remaining constant, and similarly, whenever the capital resource increases by 1%, production increases by (0.701%) with the labor resource remaining constant.

The fixed limit (A), with a value of 3.32, represents the technical level, as its value can be increased by using high-productivity varieties in addition to developing and improving work mechanisms.

The sum of the returns to scale of the function estimated above was about (0.805), which represents the sum of the partial production elasticities for both labor and capital suppliers, and the sum of their values is less than one, and this means that the estimated production function for imported wheat varieties indicates diminishing returns to capacity, and from this we conclude that increasing the use of production resources by 1% It leads to an increase in wheat production for local varieties by (0.805), and this case means that wheat farmers produce in the second stage of the production stages of the law of diminishing returns, which is the rational production zone.

Statistical analysis

The (t) test resulting from the statistical analysis of the estimated function data showed the significance of the estimated parameters at the (1%) level, while the coefficients of the estimated function variables, namely labor and capital, were significant at the (1%) level. The F test also showed the significance of the function as a whole at Significance level (1%), While the value of the coefficient of determination (R^2 = 0.81) showed us, this explains to us that (81%) of the changes occurring in production are caused by changes occurring in the independent (explanatory) variables included in the model, which are (L, K), and that (19%) of These changes are due to other factors not included in the model.

Econometric analysis

A- Auto correlation problem for the random variable

The model showed that there is no problem of autocorrelation between the random variables after conducting the Durbin-Watson test (Koutsoyiannis, 1977), because the calculated value of the Durbin-Watson (D.W) test is equal to (1.83) for a significance level of 5%), this value falls within the range (du < D.w < 4-du), meaning its value is limited to (1.51 < 1.83 < 2.35), as the calculated D.w value is greater than du and smaller than 4-du, meaning it falls in the acceptance area (the decisive decision). From this we conclude that there is no autocorrelation between the random variables.

B - The problem of heteroscedasticity

Since the study relied on cross-section data, it is necessary to detect the problem of heteroscedasticity, as it is expected that there will be a problem of heteroscedasticity, and the Park Johnston test (1984:

568) was used, which works to estimate the square error regression equation as a dependent variable on the (independent) explanatory variables in the model, which are L and K), and the estimated functions are in double logarithmic form and are as follows:

1 - Error Boundary Square Test for the explanatory variable Labor (L)

$$\ln ei^2 = a + b \ln L$$

$$\ln ei^2 = -0.0066 + 0.001 \ln L$$

$$t \quad (-0.28) \quad (0.39)$$

$$F = 0.15 \ , R^2 = 0.0027$$

2 - Error bound square Test for the explanatory variable Capital (K)

$$\ln ei^2 = a + b \ln K$$

$$\ln ei^2 = 0.00103 + 0.000089 \ln K$$

$$t \quad (0.072) \quad (0.0044)$$

$$F = 0.0005 \ , \ R^2 = 0.01$$

Since the estimated functions are not significant below the level of (5%) according to the (F) statistic, and as appears from the test results for the above models, because the calculated (F) value is much less than the tabulated (F), we conclude that there is no problem of heterogeneity of variance.

C - Multicollinearity problem

Thus, the problem of multicollinearity became when two or more workers shared a linear relationship so strong that it became difficult to separate the effect of all the diversity from the contribution to the two variables, and to reveal, the existence of the problem of multicollinearity between the World Wide Web, quickly contact us through the matrix of diverse multicollinearity between researchers through the Klein Test (Maddala, 1988: 271-295).

Table 6. Klein Test to Find Multicollinearity in a Partial Correlation Matrix

	L	K
L	1	0.0801
K	0.0801	1

Source: Calculated by the researcher using the Eviews 12 program based on the data from the questionnaire.

The simple correlation matrix above shows that there is no the problem of multiple linear correlation between independent variables, because the simple correlation coefficient between the independent variables (L, K), which has a value of (0.08), is less than the value of the total correlation coefficient of the estimated model, which has a value of (0.885), and also by comparing the coefficient of determination (R^2) with the square of the correlation coefficient between the independent variables, If the coefficient of determination (R^2) is greater than the square of the correlation coefficient between the independent variables, this means that there is no problem of multiple linear correlation.

5. Conclusions

It was noted that the relative importance of variable costs in imported wheat to the total costs was approximately (77.69)%, and seed costs constituted (17.26)% of the total costs, while the relative importance of fixed costs to the total costs was approximately (22.31)%, and this is due to the high

percentage Variable costs in imported seeds due to high seed prices, While in local wheat, the relative importance of variable costs to total costs was around (72.19)%, of which seed costs constituted (9.91)%, while the relative importance of fixed costs to total costs was around (27.81)%, and from this we conclude that the increase in the percentage The variable costs of imported wheat are due to the rise in seed prices, from the production averages, we note that the highest average production of imported varieties is achieved by the (Ozkan) variety, which amounts to (1227.75) kg/dunum, and that the highest average production of local varieties is achieved by the (Ibaa 99) variety, which amounts to (845.36) kg/dunum, while the lowest average Production of imported varieties is achieved by the variety (Wafiya), which is approximately (1102.5) kg/dunum, while the lowest average production of local varieties is achieved by the variety (Buhouth 22), which is approximately (670.25) kg/dunum, While the average production per dunum of imported wheat for the studied varieties was around (1167.25) kg, and the average production per dunum of local wheat for the studied varieties was around (770.83) kg. As for the average total costs per dunum, it was approximately (344,635.7) dinars/dunum for local wheat and approximately (444,381.1) dinars/dunum for imported wheat. We note that the percentage increase in costs was approximately (28.94%), While the average total yield per dunum in local wheat was around (655,203.6) dinars/dunum, and in imported wheat, the average total yield per dunum was around (992,162.5) dinars/dunum, and this difference is due to the high dunum productivity of the imported varieties compared to the local varieties. As for the average net profit per dunum It was approximately (310567.9) dinars/dunum for local varieties and approximately (547781.1) dinars/dunum for imported varieties. From these numbers we notice the large gap in the amounts obtained from profits per dunum, the percentage of increase in which in this study reaches about (76.38%), which is attributed to the large difference in production per dunum between local wheat and imported wheat. The economic analysis of the estimated function of domestic production showed also, the parameters of the estimated independent variables (labor and capital) agree with economic logic and are directly proportional to the dependent variable (production) because their signs are positive, and that the productive elasticities for both labor and capital were in the range of (0.117, 0.459), respectively, the sum of the capacity returns of the estimated function. Above, it reached about (0.576), which means that the estimated production function for local wheat varieties indicates decreasing returns to capacity, From this, we conclude that increasing the use of production resources by 1% leads to an increase in wheat production for local varieties by (0.576), and from the economic analysis of the estimated production function for imported wheat, we conclude that the parameters of the estimated independent variables (labor and capital) are consistent with economic logic and are directly proportional to the dependent variable (production) (production) because their signs are positive, the production elasticities for both labor and capital were in the range of (0.104 and 0.701), respectively. The total returns to capacity for the function estimated above amounted to about (0.805). This means that the estimated production function for the imported wheat varieties indicates diminishing returns to capacity, and from this we conclude that: Increasing the use of production resources by 1% leads to an increase in wheat production for local varieties by (0.805). That is, it is in the second stage of the production stages of the law of diminishing returns, which is the rational production zone.

Recommendations

Considering the results obtained from it, the research recommends the following:

1. Working to improve and develop the quality of local seeds. This is done through selection and hybridization processes, as most of the local varieties have deteriorated due to neglect and lack of interest in them by farmers, and to reduce the large gap in the productivity rate per dunum between local varieties and imported varieties.

2. Paying attention to specialized research centers to keep pace with the great progress that has occurred in the field of breeding and improving wheat and barley varieties, and allocating the necessary funds to scientific research institutions working in this field to support specialized research and studies, and working to find a clear mechanism for linking and cooperation between scientific research institutions and workers in the field of research and development on the one hand. And among seed producers on the other hand.

3. Paying attention to the Seed Technology Center of the Agricultural Research Department in the Ministry of Science and Technology as it is the basis for improving and producing seeds in Iraq, as the center needs to rehabilitate its research stations that were destroyed during the military operations after the events of 2014.

4. Providing continuous material and moral support to researchers working in research stations, publishing their research and applying it practically, and working to have them participate in courses and seminars and sending them to developed countries to develop their potential and sustain work in the stations.

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