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## **STUDYING THE COSTS OF TRANSPORTATION, STORAGE AND THE LOSS OF WHEAT CROP DURING HARVESTING OPERATIONS IN IRAQ**

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**Abstract** : This study was conducted in one of the fields belonging to the Mesopotamian company in 2022 in order to know the necessary expenses and the loss of time that may occur during transportation and storage using traditional means, where two fields planted with wheat class 99 parents were used and the harvest was done with a New Holland type TC 5040 harvester and 9 transport vehicles with a capacity of 20 tons[ 5], the results showed that there are significant losses up to 2250 dollars and a loss of time up to 703.9 minutes What amends 9.77% - 12.56% during the harvest is only 176 tons, which is a very large figure and can be significantly reduced using modern technologies such as trailers and polyethylene hoses widely used in developed countries such as the Russian Federation and China

**Key words :** *Harvest, Wheat, Percentage Loss , Polyethylene, Storage Duration.*

**Introduction**

Due to population growth and continuous population growth and in the context of continuous development in all areas, it became necessary to find new ways to preserve agricultural crops[5], including cereals, which are considered one of the most important strategic crops in the world in general and in Iraq in particular, as transportation and storage methods have become very expensive for Compared with the increase in global demand for wheat in Iraq, two fields were selected from the fields of a prolific Mesopotamian company during the harvest process, the area of each field is estimated at 20 hectares, and the yield per hectare was estimated at 4.4 tons, while a New Holland TC 5040 type harvester, model 2010[7 ], and 20-ton transport vehicles of different brands were used. find out the difference in the exchange of fuel for each machine when transporting wheat to a silo intended for storage, which is located 34 kilometers from the location of the field. Several important factors were affected in this experiment, including the loss of time and manual labor, as well as transportation costs. The purpose of this experiment is to obtain the real cost of transportation and storage operations and compare it with modern methods such as trailers and polyethylene hoses used in developed countries such as Russia and China[6].

The wheat growing season in Iraq begins depending on the geographical region and temperature difference [3], starting from mid-October to the end of November, and the harvest season begins at the end of April and lasts until the end of June, as the Iraqi atmosphere is characterized by the duration of the summer season and the absence of precipitation throughout the Year [2], and this experiment was conducted in mid-May 2022. Two adjacent fields were selected from the same area, the area of one field is estimated at 20 hectares, irrigated by the Tigris River and sown with wheat seeds of the local ABA 99 variety [1]

After harvesting and making calculations, the yield of one hectare is equivalent to 4.4 tons, and the total production volume is equivalent to 176 tons. It is worth noting that the New Holland TC 5040 harvester of the 2010 model with a grain tank capacity of 3 tons was used , this combination is the most common and used in Iraq , because it is suitable for working conditions there.

After the harvest was completed, the transportation of the crop to the silo was carried out by transport vehicle, and due to difficult field conditions, since the soil is fertile and does not allow heavy trucks to enter, it was necessary to use 9 trucks with a capacity of 20 tons to transport the crop [4]. And in order to find out the real cost, the cost of each car was calculated separately, since these are different types and models, as shown in Table No. 3

*Table No. 1*

Number	Type of car	Engine size	Fuel consumption h/l	Actual exchange/ l	Fuel price l/ USD	Total amount
1	Volvo	8 salamander	33	18.6	0.70	13.02

2	Mercedes	8 salamander	34	20.4	0.70	14.28
3	Iveco	8 salamander	37	22.2	0.70	15.54
4	Mercedes	12 containers	40	24	0.70	16.80
5	Volvo	8 salamander	33	18.6	0.70	13.02
6	Scania	12 containers	39	23.4	0.70	16.38
7	Mercedes	8 salamander	33	18.6	0.70	13.02
8	Mercedes	8 salamander	34	20.4	0.70	14.28
9	Mercedes	12 containers	40	24	0.70	16.80
All				190.2		133.14

After using mathematical equations, the fuel exchange rate for each car was calculated and the total exchange rate for all cars was calculated, which is \$133.14, and when calculating the driver's fare for each car, which is \$40 \* 9, the total amount becomes \$360

The equation becomes = driver's salary + fuel cost = required amount  
 $360 + 133,14 = 493,14$  доллара.

This is the cost, considering that the cars are private for a farm that is a state farm, but if the cars are rented because the farm is state-owned, then the fare for each car is \$ 250 \* 9, and the amount becomes \$2,250, which is a very large amount compared to the production volume of 176 tons[4 ].

On the other hand, this is a delay problem due to the unloading of the combine during harvesting due to the tank capacity of only 3 tons, and it takes 12 minutes to empty the tank

The equation looks like this

Number of digits =  $176 \div 3 = 58.6$  times

And when multiplying the number \* 12 minutes

Lost time = 703.9 minutes

As for the duration of harvesting per hectare, the duration ranged from 140 to 180 minutes per hectare \* 40 hectares, the time spent varies between 5600-7200 working minutes, and from this experiment using mathematical operations, we conclude that the percentage of time lost varies between 9.77% -12.56%, and this figure is considered very large and leads to significant losses

**Conclusion.** From this study, we came to the conclusion that the continuation of traditional methods of transportation and storage in Iraq leads to significant crop losses during harvesting due to the loss of time, effort and fuel, and therefore, in order to obtain the best results, on-site storage methods using trailers and polyethylene hoses should be implemented.

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### **ГИДРОФОБНОЕ ПОКРЫТИЕ НА АЛЮМИНИИ**

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***Аннотация:** В работе описано получение супергидрофобных образцов алюминия, в которые закапсулирован антибактериальный агент 1,3-бис(2-этилгексил) гексагидро-5-метил-5-пиримидинамин. Совокупность этих факторов придает поверхности алюминия безопасные для человека антибактериальные свойства.*

***Ключевые слова:** супергидрофобные покрытия, гидрофильные покрытия, смачиваемость.*

На предметах и окружающих поверхностях зачастую обитают различные микроорганизмы, в случае если эти микроорганизмы являются патогенными наблюдается распространение различных инфекционных заболеваний, что существенно ухудшает качество жизни человечества. В условиях повышенной плотности населения и активного развития стойких штаммов бактерий и вирусов эта проблема становится крайне актуальной.

Существует множество подходов для решения данной проблемы, один из них, наиболее древний – повсеместное использования материалов, обладающих антибактериальными свойствами, например, медь, серебро и т.д. Очевидно, что данный подход является слишком затратным и неэкологичным. Другой подход заключается в обработке всех поверхностей дезинфицирующими средствами, данный подход, приводит к развитию