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THE USE OF THE PRODUCTION CAPACITY OF MEANS OF TRANSPORT DEPENDING ON THE FARM OWNER'S EDUCATION

Summary

The study presents the results of research on the use of the production capacity of means of transport in the context of the farm owner's education. The availability of tractors per 100 ha of cultivated land clearly decreases with the growing level of education. A similar tendency is shown by the availability of means of transport in pieces per farm. In all designated groups of the level of education, dropside trailers have the highest share. In general, it can be stated that the annual use and the related use of the production capacity on all kinds of the analysed means of transport is low and it does not show a clear relationship with the level of education. The annual average come as: tractors 5,27%, load box trailers 4,75%, trucks 4,53%.
***Key words**: transport, means of transport, tractors, trailers, vehicles, use, production capacity, farmer's education*

WYKORZYSTANIE ZDOLNOŚCI PRODUKCYJNYCH ŚRODKÓW TRANSPORTOWYCH W ZALEŻNOŚCI OD WYKSZTAŁCENIA WŁAŚCICIELA GOSPODARSTWA

Streszczenie

Przedstawiono wyniki badań dotyczących wykorzystania zdolności produkcyjnych środków transportowych w kontekście wykształcenia właściciela gospodarstwa. Wyposażenie w ciągniki w przeliczeniu na 100 ha UR wyraźnie maleje w miarę wzrostu poziomu wykształcenia. Podobną tendencję wykazuje wyposażenie w środki transportowe w sztukach na gospodarstwo. We wszystkich wydzielonych grupach poziomu wykształcenia największy udział mają przyczepy skrzyniowe. Generalnie można stwierdzić, iż roczne wykorzystanie i związane z tym wykorzystanie zdolności produkcyjnych we wszystkich rodzajach analizowanych środków jest niskie i nie wykazuje wyraźnego związku z poziomem wykształcenia. Średnio rocznie wynosi: ciągniki 5,27%, przyczepy 4,75%, samochody ciężarowe 4,53%.
***Słowa kluczowe**: transport, środki transportowe, ciągniki przyczepy, samochody, wykorzystanie, zdolności produkcyjne, wykształcenie właściciela*

1. Introduction

Approx. 75% of the logistics costs of companies' activities are the costs of transport and storage [1, 2]. Hence, the level of availability of means of transport and their use has a significant influence of the farming effectiveness (especially on costs). The share of the means of transport in the equipment structure of farms is considerable. According to Grześ [3], it is 23% (the highest as compared to other groups of machines) and their differentiation has a significant influence on the effectiveness of production [4].

At the same time, according to many authors of studies, the use of the production capacity of technical means is at a low level and, as a result, they are used for many years (their service life is very long), in some groups of means it is over 20 years, with a few percent use of the potential during the year [5, 6, 7, 8]. The observed increase in the service life mostly results from the financial possibilities of farms and, as it seems, also from social limitations. The ageing society issue also pertains to rural areas. According to the research, younger and better educated farmers invest in the purchase of new technical means much more often [9].

2. Aim and scope of the study

The effectiveness of management and expenditures incurred for production is determined not only by the equipment in technical means. The basic condition was the commodity production, and then the owner declaration that the farm will be maintained for a next few years. Hence, the aim of the study is an assessment of the use of the production capacity of means of transport available on farms with various surface areas of cultivated land. The analysis focuses on universal-dropside means of transport available on selected farms. 166 farms situated in the Lesser Poland Region were included in the study. The research included farms within the reach of secondary and vocational agricultural schools. During a guided interview, current farm owners and their successors (students of agricultural schools), declared their willingness of continuing to run the farm and, in the majority of cases, their willingness to enlarge the farm. Hence, it can be assumed that these farms are likely to develop. The analysis of the equipment was performed in the context of farm owner education. The farms under analysis were divided into the following groups, taking into account the education of their owners:
A – primary – 7 persons – 4.22%
B – vocational – 87 persons – 52.41%
C – secondary – 65 persons – 39.15%
D – higher – 7 persons – 4.22%.

3. Research methodology

The research was performed on the basis of guided clinical interview and the objects of the research were se-

lected purposefully - declaration of conducting agricultural production at an invariable level or, which was quite frequently encountered, of an increase in the production. One of the basic questions of the interview pertained to the means of transport owned by the farm – their type and characteristics (load capacity, usage, year of manufacture and purchase). For the assessment of the use of the potential production capacity of means of transport, the index of use of the production capacity was accepted after Tabor [8] in the following form:

$$K_{wp} = \frac{W_{rz}}{n} \cdot 100 \ [\%],$$

where:
K_{wp} – level of use of potential production capacity [%],
W_{rz} – actual use during the year [h],
n – service life – normative use of means of transport during their service [h].

Service life – normative use of means of transport during service was accepted according to Swiss data after Lorencowicz [6].

4. Research results

In the group of farm owners with higher education, the surface area of arable land is 2.36 times higher as compared to owners with primary education.

The basic farming condition which influences transport effectiveness - the distance, both in internal and external transport does not show any connection with education. The availability of tractors per 100 ha of cultivated land clearly decreases with the growing level of education. This fact may show that farmers attach more importance to good organization of work and to an increase in the use of the production capacity of tractors as their level of education grows. In all designated groups of the level of education, dropside trailers have the highest and growing shares, on average 82.38% (from 71.43 to 93.07%).

The exact characteristics of the examined farms (transport conditions and provision with means pf transport) were presented in an earlier paper by the author [10].

The effect of the equipment and the amount of work to be done on a farm is the use of the production capacity shown in Table 1. In general, on the basis of values presented in the table, it can be stated that the annual use and the related use of the production capacity on all kinds of the analysed means of transport is low and it does not show a clear relationship with the level of education. On average, the highest annual use of the production capacity was observed in the group of trucks (4.53%), and the highest in the group of delivery vans (5.80%).

Moreover, it can be stated that the annual use and the related use of the production capacity on all kinds of the analysed means of transport is low and it does not show a clear relationship with the level of education. On average, the lowest annual use of the production capacity was observed in the group of trucks (4.53%) and the highest in the group of delivery vans (5.80%), this fact will reflect the demand for the means of transport under analysis.

Table 1. Use of production capacity
Tab. 1. Wykorzystanie zdolności produkcyjnych

Specification	Unit	Owner's education				
		On average	Group A	Group B	Group C	Group D
Tractors						
Hours of operation per year	[h]	527	505	461	624	359
Share of transport works	[%]	48.49	45.50	48.43	49.27	42.82
Service life	[h]	10000	10000	10000	10000	10000
Use of production capacity	[%]	5.27	5.05	4.61	6.24	3.59
Number of depreciation years	[years]	19	20	22	16	28
Current age	[years]	17	20	18	15	20
Share of means of transport after service life	[%]	67.11	66.64	61.49	74.20	30.55
Load box trailers						
Hours of operation per year	[h]	261	281	274	324	122
Service life	[h]	5500	5500	5500	5500	5500
Use of production capacity	[%]	4.75	5.11	4.98	5.89	2.22
Number of depreciation years	[years]	21	20	20	17	45
Current age	[years]	21	24	20	20	22
Share of means of transport after service life	[%]	42.15	44.44	36.13	37.29	6.67
Trucks						
Hours of operation per year	[h]	725	---	740	720	---
Service life	[h]	16000	16000	16000	1600	1600
Use of production capacity	[%]	4.53	---	4.63	4.50	---
Number of depreciation years	[years]	22	---	22	22	---
Current age	[years]	12	---	13	12	---
Share of means of transport after service life	[%]	0.00	---	0.00	0.00	---
Delivery vehicles						
Hours of operation per year	[h]	545	500	569	511	540
Service life	[h]	9400	9400	9400	9400	9400
Use of production capacity	[%]	5.80	5.32	6.01	5.44	5.74
Number of depreciation years	[years]	17	19	17	18	17
Current age	[years]	14	23	13	13	20
Share of means of transport after service life	[%]	23.21	100.00	20.59	15.79	100.00

* delivery vans, trucks, load box trailers and tow tractors.

Source: own work. *Źródło*: opracowanie własne

However, when asked an additional question about the technical conditions of the means of transport, their owners replied: good or very good. It must be mentioned here that, in particular, for trailers, those were completely reconstructed means in many cases.

The analysis of the use of the production capacity of tractors in the context of their power (usage groups), as presented in Table 2, shows that the indices of the use of the production potential and the age of tractors have positive values within the group under analysis.

Table 2. Use of the production capacity of trailers in the context of their power
Tab. 2. Wykorzystanie zdolności produkcyjnych ciągników w kontekście ich mocy

Specification	Unit	Trailer usage group			
		light	medium	heavy	very heavy
Hours of operation per year field+transport	H	400	446	583	1306
Service life	H	10000	10000	10000	10000
Use of production capacity	%	4.00	4.46	5.83	13.06
Number of depreciation years	Years	25	22	17	8
Current age	Years	24	18	12	5
Share of means of transport after service life	%	55.17	63.87	36.05	15.38

Source: own work / *Źródło*: opracowanie własne

Also, the indices of the use of the production capacity for trailers presented in Table 3, i.e. the annual, use, the use of the production capacity, the age of means for means with the highest share in the equipment, show advantageous values together with an increase in the payload capacity of trailers. Trailers with the highest payload are the youngest with the highest level of the use of their production capacity.

Table 3. Use of the production capacity of trailers in the context of their payload
Tab. 3. Wykorzystanie zdolności produkcyjnych przyczep w kontekście ich ładowności

Specification	Unit	Trailer payload [t]			
		up to 3.0	3-5	5-8	area 8
Hours of operation per year	H	163	232	274	306
Service life	H	5000	5000	6000	6000
Use of production capacity	%	3.26	4.64	4.57	5.10
Number of depreciation years	Years	31	22	22	20
Current age	Years	19	23	18	7
Share of means of transport after service life	%	19.30	64.79	45.83	14.29

Source: own work / *Źródło*: opracowanie własne

Transport is a complex activity, it requires cooperation of the means of transport and loading and unloading devices. Both of these have a significant influence on transport effectiveness. In this context, it must be concluded that the availability of the aforementioned devices grows together with the level of education. With the average of 37.95% of farms equipped with loading and unloading devices, in the case of owners with primary education this value is 29.14% and for owners with higher education this value amounts to 42.85%.

5. Summary and conclusions

With the average surface area of cultivated land of 26.24 ha, together with an increase in the level of education, there occurs a considerable increase in the group of farm owners with higher education, the surface area of cultivated land is 2.36 times higher for educated owners.

In general, it can be stated that the annual use and the related use of the production capacity on all kinds of the analysed means of transport is low and it does not show a clear relationship with the level of education. This is probably due to the diverse quantitative and qualitative equipment with technical means, not related to education.

It can be noted that the maximum capacity utilization occurs among farmers with secondary education; simultaneously they are youngest owners within the analyzed groups.

On average, the highest annual use of the production capacity was observed in the group of trucks (4.53%), and the highest in the group of delivery vans (5.80%). The use of th production capacity and the age of the means of transport with the highest share in the equipment - trailers - show advantageous values with an increase in the payload. Trailers with the highest payload are the youngest with the highest level of the use of their production capacity. The number of farms with loading and unloading devices increases together with a growing level of education - 29.41% for primary education and 42.85% for secondary education.

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