

AGE OF FARM'S OWNER VS. TRANSPORTATION EQUIPMENT OF FARM

Summary

This paper presents results of research on transportation equipment of farms in the context of farm owner's age. Equipment in transportation vehicles per 100 ha of farming area and total load capacity per farm decreases considerably along with an increase in farm owner's age. On the other hand, equipment of farms in loading and unloading machines increases along with an increase in farmer's age. On average, 37.95% of farms are equipped in loading and unloading machines with 26.92% for the youngest age group and 59.09% for the oldest age group. Box-type trailers have the largest share in the number of transportation means per farm and there is no correlation between this value and farmer's age. Within the examined group, the largest share of means is medium load capacity vehicles (3-5 tonnes), 42.43% on average with an increasing tendency along with an increase in farmer's age. The next group of means includes small load capacity vehicles (up to 3 tonnes) and their share shows a tendency identical with this one for medium load capacity vehicles. Within trailers, share of the newest vehicles (less than 10 years) decreases considerably along with an increase in farmer's age.

Key words: transportation, farmer's age, means of transportation, equipment, number, load capacity

WIEK WŁAŚCICIELA A WYPOSAŻENIE GOSPODARSTWA ROLNICZEGO W ŚRODKI TRANSPORTOWE

Streszczenie

Przedstawiono wyniki badań dotyczących wyposażenia gospodarstw w środki transportowe w kontekście wieku właściciela gospodarstwa. Wyposażenie w środki transportowe w sztukach na 100 ha UR oraz ładowności całkowitej na gospodarstwo w miarę wzrostu wieku właściciela wyraźnie maleje. Z kolei wyposażenie gospodarstw w urządzenia za- i wyladunkowe roślin w miarę wzrostu wieku rolnika. Średnio 37,95% gospodarstw posiada urządzenia za- i wyladunkowe, w grupie rolników najmłodszych – 26,92%, natomiast najstarszych – 59,09%. Największy udział w ilości środków na gospodarstwo mają przyczepy skrzyniowe i nie ma związku z wiekiem rolnika. Najwyższy udział w badanej grupie mają środki o średniej ładowności (3-5 ton), średnio 42,43% i ich udział w miarę wzrostu wieku rolnika rośnie. Kolejną grupą środków są środki o małej ładowności (do 3 ton) i ich udział wykazuje tendencję identyczną, jak w grupie środków o średniej ładowności. W grupie ciągników udział ciągników najmłodszych (poniżej 10 lat) wyraźnie maleje w miarę wzrostu wieku rolnika.

Słowa kluczowe: transport, wiek rolnika, środki transportowe, wyposażenie, ilość, ładowność

1. Introduction

Diversified conditions, diversified load types and sizes of load shipped at a time reveal the transportation in a farm as one of the activities which involve highest expenses [3, 9]. Reduction of transportation cost may be achieved through a proper selection of number and type of means of transportation and more efficient organisation of transportation processes, as well as through reducing the cost of use for existing machinery [2, 4, 8]. Analyses of equipment in means of transportation depending on farm's operating conditions prove significant diversification between farming enterprises. There is a low dynamics of changes along time, which signifies that this is the oldest group of technical means used in farms [6]. Simultaneously, farming efficiency and equipment in technical means is determined by a number of factors, including farmer's age [1, 7].

2. Scope and aim of work

Due to changes occurring in agriculture, concerning also, or even above all, equipment in technical means of production resulting from availability of such means on primary and secondary market, this paper aims at an analysis of equipment of farms in means of transportation. The subject of this analysis is box-type transportation vehicles in possession of selected farms in the Małopolska region. Research included 166 farms in the Małopolska region.

Owners of farms included in the study were divided into three age groups:

- A – up to 40 years of age 26 farms – 15.66%,
- B – 41 – 55 years of age 118 farms – 71.08%,
- C – over 55 years of age 22 farms – 13.26%.

3. Methodology

Research was carried out based on a dedicated survey and research subjects were selected deliberately – declaration of running agricultural production on the same level or, which occurred quite often, an increase in production. One of the core questions of the survey concerned equipment in transportation means – their type and specification (load capacity, use, year of manufacturing, year of purchase). A detailed research methodology has been presented in a previous work by the same authors [5].

4. Results

Equipment in transportation means results, among others, from farming and transportation conditions. The average age of subjects was years, with the following average values for each subsequent age group: group A 31.92; group B 47.28; and group C 58.77 years. With the average farming area of 26.24 ha, farming area decreases noticeably along with an increase in farmer's age. Also, along with an increase in farmer's age, a considerable decrease in produce

sale occurs, expressed in the number of tonnes of sold produce, on average 5.22 t*ha⁻¹, 6.38 for the youngest age group, and 2.77 t*ha⁻¹ for the oldest age group. A detailed characteristics of farms examined within the context of owner's age has been presented in a previous work [5].

Equipment in trailer and transportation means presented in Table 1 result from farming conditions, but also from certain preferences of farmers, sometimes an irrational desire to own e.g. a lorry.

As appears from data compiled in the table, equipment in tractors shows little variation and no relation to the farmer's age is visible. Equipment in transportation vehicles per 100 ha of farming area and total load capacity per farm decreases considerably along with an increase in farm owner's age. It most likely results from a decreasing tendency in farm size, because the number of vehicles per farm does not demonstrate such a tendency.

It should be noted that equipment of farms in loading and unloading machines increases along with an increase in farmer's age. On average, 37.95% of farms are equipped in loading and unloading machines with 26.92% for the youngest age group and 59.09% for the oldest age group.

Work efficiency in transportation depends not only on farming conditions, but also on the type of transportation means and its key parameter, that is load capacity. Share of subsequent types of transportation means in the total number and load capacity of transportation means per farm is presented in Table 2.

The largest share in the total number of transportation means per farm belongs to box-type trailers. Generally speaking, there is no distinct relation between the farmer's age and equipment in transportation means. Only in regard

to delivery vehicles, along with an increase in farmer's age, the share of these vehicles in the total load capacity decreases.

Load capacity of a transportation means, if used properly, is the basic factor that influences work efficiency. Thus Table 3 presents a percentage share of transportation means in regard to load capacity ranges.

Within the examined group, the largest share of means is medium load capacity vehicles (3-5 tonnes), 42.43% on average with an increasing tendency along with an increase in farmer's age. The next group of means is small load capacity vehicles (up to 3 tonnes) and their share shows a tendency identical with this one for medium load capacity vehicles.

The share of high load capacity means, 5-8 tonnes and over 8 tonnes, is least favourable.

In both load capacity ranges, there is a decreasing tendency along an increase in age.

This may be related to farm size, but also to awareness of the youngest farmers that transportation means of higher load capacity are more efficient.

Current tendencies in construction of transportation means aim at adapting them to working conditions, but most importantly, at equipping them in their own loading and unloading machines. Therefore, the age of examined transportation means, as presented in Table 4, may prove their modern construction.

With the average age of tractors of 17 years, their age increases along with an increase in farmer's age. Tractor carts and box-type trailers are the oldest transportation means. The share of the oldest means (over 10 years, usually past service life) is most favourable for cars (they occur in group B only) and for tractors.

Table 1. Equipment in tractors and means of transportation

Tab. 1. Wyposażenie w ciągniki i środki transportowe

Description	Unit	Owner's age			
		average	group A	group B	group C
Tractors					
Pieces per farm	[pcs.]	1,81	1,77	1,84	1,73
Pieces per 100 ha of farming area	[pcs.]	6,90	6,36	7,05	6,72
Number of ha per tractor	[ha]	14,49	20,13	13,73	11,76
Tractor's average power	[kW]	50,01	56,42	48,84	48,29
Transportation means*					
Pieces per farm	[pcs.]	2,23	2,23	2,28	1,95
Pieces per 100 ha of farming area	[pcs.]	10,78	14,65	10,16	9,56
Total load capacity in tonnes per farm	[t]	8,64	8,65	9,01	7,14
Tonnes per 1 ha of farming area	t*1ha ⁻¹	0,33	0,24	0,36	0,35
Average load capacity	t	3,88	3,88	3,95	3,66

*delivery vehicles, lorries, box-type trailers, tractor carts

Source: own work / Źródło: opracowanie własne

Table 2. Structure of equipment in transportation means in the context of their number and load capacity [%]

Tab. 2. Struktura wyposażenia w środki transportowe w kontekście ich ilości i ładowności całkowitej [%]

Description	Unit	Owner's age			
		average	group A	group B	group C
Percentage share of types of transportation means in the total number of transportation means per farm					
Lorries	[%]	2,97	1,72	3,71	0,00
Delivery vehicles	[%]	15,14	10,34	17,47	6,98
Box-type trailers	[%]	70,54	77,59	67,66	79,07
Tractor carts	[%]	11,35	10,35	11,16	13,95
Percentage share of types of transportation means in the total load capacity of transportation means per farm					
Lorries	[%]	4,64	1,93	6,41	0,00
Delivery vehicles	[%]	6,26	4,90	8,95	2,37
Box-type trailers	[%]	82,38	85,45	77,24	85,59
Tractor carts	[%]	6,72	7,72	7,40	12,04

Source: own work. / Źródło: opracowanie własne

Table 3. Distribution of load capacity of means per group (pieces per farm) [%]
 Tab. 3. Rozkład ładowności środków w grupach (sztuk na gospodarstwo) [%]

Description	Unit	Owner's age			
		average	group A	group B	group C
Load capacity up to 3 tonnes	[%]	39,49	35,36	38,86	45,19
Load capacity of 3-5 tonnes	[%]	42,43	39,00	43,80	46,83
Load capacity of 5-8 tonnes	[%]	14,59	21,21	14,02	7,98
Load capacity over 8 tonnes	[%]	3,49	4,43	3,32	0,00

Source: own work. / Źródło: opracowanie własne

Table 4. Age of transportation means in studied farms
 Tab. 4. Wiek środków w badanych gospodarstwach

Description	Unit	Owner's age			
		average	group A	group B	group C
Age of means					
Tractors	[years]	17	15	18	19
Lorries	[years]	12	14	11	--
Delivery vehicles	[years]	14	13	14	17
Box-type trailers	[years]	21	20	21	21
Tractor carts	[years]	23	17	24	27
Percentage share of means under 10 years of age					
Tractors	[%]	25,58	35,88	23,44	10,85
Lorries	[%]	30,00	0,00	33,00	--
Delivery vehicles	[%]	20,00	16,67	19,15	33,33
Box-type trailers	[%]	18,00	26,71	15,02	22,50
Tractor carts	[%]	4,88	8,04	1,72	0,00
Percentage share of means purchased as new (primary market purchases)					
Tractors	[%]	52,82	47,83	56,22	36,84
Lorries	[%]	18,18	100,00	10,00	--
Delivery vehicles	[%]	12,50	16,67	10,64	33,33
Box-type trailers	[%]	47,13	38,66	46,97	59,25
Tractor carts	[%]	79,19	66,67	80,00	100,00

Source: own work. / Źródło: opracowanie własne

For the latter ones, share of the newest vehicles (less than 10 years) decreases considerably along with an increase in farmer's age. Tractor carts were the transportation means most frequently purchased on the primary market, with the average of 79.19% and an increasing tendency along with an increase in farmer's age. Tractors are the second most frequently purchase means with a decreasing tendency along an increase in farmer's age. Trailers' share is 47,13% and shows an increasing tendency along with an increase in farmer's age.

5. Summary and conclusions

The average age of subjects was years, with the following average values for each subsequent age group: group A 31.92; group B 47.28; and group C 58.77 years. With the average farming area of 26.24 ha, farming area decreases noticeably along with an increase in farmer's age. Percentage share of arable land also decreases. Equipment in transportation vehicles per 100 ha of farming area and total load capacity per farm decreases considerably along with an increase in farm owner's age. It most likely results from a decreasing tendency in farm size, because the number of vehicles per farm does not demonstrate such a tendency. On the other hand, equipment of farms in loading and unloading machines increases along with an increase in farmer's age. On average, 37.95% of farms are equipped in loading and unloading machines with 26.92% for the youngest age group and 59.09% for the oldest age group. Box-type trailers have the largest share in the number of transportation means per farm and there is no correlation between this value and farmer's age. Within the examined group, the largest share of means is medium load capacity vehicles (3-5 tonnes), 42.43% on average with an increasing tendency

along with an increase in farmer's age. The next group of means is small load capacity vehicles (up to 3 tonnes) and their share shows a tendency identical with this one for medium load capacity vehicles. Tractor carts and box-type trailers are the oldest transportation means. Within trailers, share of the newest vehicles (less than 10 years) decreases considerably along with an increase in farmer's age.

6. References

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