

UDS 631.1.016:631.22:471:475

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## Development of small farms in Ukraine and the Polish experience

**Scientific problem.** Current state of the domestic agricultural sector has resulted in significant macroeconomic transformation of the political and socio-economic structure of our country. Carried out radical reforms in various industries, designed and important legislative acts were adopted in the development of the national economy. Quite often hear the idea of creating family farms as a promising directions of development of agriculture of Ukraine. However, the problem of technical and technological support of agricultural production due to various reasons is not sufficiently solved. Technical support agriculture reached a critical threshold. Today, farms of all forms of ownership provided the main agricultural machines only by 45-50%, about 85% of them have completed their amortization period. The material and technical basis is not possible to meet the technological needs of agricultural producers, thereby creating technical collapse in the agricultural sector.

**Analysis of recent researches and publications.** The study of technical and technological support of the agricultural sector devoted a significant amount of scientific papers. They reflect different aspects of this process: the provision of agricultural machinery of various categories of farms, manufacture, market and leasing of agricultural machinery. The most extensive research in these areas were research and development Y. K. Bilouska, V. L. Tovstop-yata, V. O. Pitulka [4] and others. Work in this direction a lot, but the technology and the market of technical means not standing still, so the study of these issues are always relevant.

**The objective of the article** of the article is the study of the technical and technological support households of Ukraine and its comparison with the provision of farms in Poland.

**Statement of the main results of the study.** In recent years there have been minor changes in the structure of land Ukraine, but the land area of the treated households increased (Table 1).

**Table 1. Distribution of agricultural land by land users, thousand ha**

Categories farms	As of January 1		2013 by 2010, %
	2010	2013	
Ukraine			
Agricultural enterprises (including farms)	20828,0	20654,5	99,2
Households	15919,9	15984,0	100,4
All categories of farms	36747,9	36638,5	99,7
Poland			
The public sector	1843	1492	81,0
The private sector	13660	13477	98,7
All categories of farms	15503	14969	96,6

Source: formed according to [1; 7].

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In households concentrated 16,0 million ha, of which for agricultural production is used 6.4 million hectares. If in 2005 the land of households in Ukraine amounted to 40% of the total area of agricultural land, then in 2013 they rose to 44%.

At the end of 2010 in private households employed 44.0 thousand. Units mini-tractors and motor cultivators and 172.5 thousand tractors middle class, despite the fact that households accounted for more than 4.6 million units. Per one tractor (including tractors and motor blocks) accounted for 30 hectares of arable land.

Now in Ukraine by 4.2 million households owned 116.0 units of mini-vehicles and 189.0 thousand tractors middle class. Per one tractor (including tractors and motor blocks) are in 21 hectares of agricultural land [2, 3].

In 2013 4.2 million households in the Ukraine was treated with 6.4 million of land, of which 903 thousand (21.5%) farms with an area of more than 1 hectare. The average area of land that is owned by a household was 1.52 ha [7]. The data reflect the situation of excessive fragmentation Ukrainian farms. In Poland, the agricultural activities are carried out by nearly 1433 thousand households (farms). 2/3 of them have tractor – 956 thousand farms. In Ukraine carry out agricultural activities having at least one tractor only 3.2% (of 160.4 thousand farms). That is, the level of loading on the tractor in agriculture of Ukraine is much higher than in other countries, particularly in Poland (Table 2).

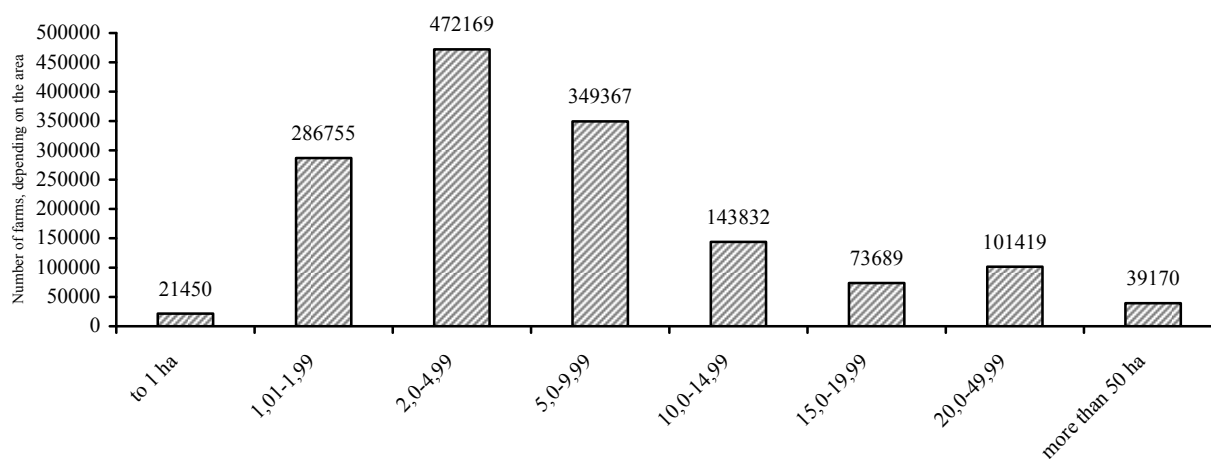
**Table 2. The availability of tractors households of Ukraine's population and farms of Poland in 2013**

	Ukraine	Poland
All households (farms)	4241,6	1433,0
The number of farms with tractors, thousand	160,0	956,5
The number of tractors, thousand pieces	304,8	1439,7
Attributable arable land 1 tractor ha	21,15	9,4
The number of tractors on 1 farm, pieces	0,07	1,0

Source: calculated according to the source [1]

The transformation taking place in the Polish farms reflect the dynamic changes in the market purchase of capital funds. Changes in the size of farms substantially affect on the technical provision compared to 2010. In 2013, there was a significant decrease in the number of households in

the area of 1 hectare. Last year their number has decreased by more than 5 times. This is due to the ability of households receive pensions after registering as a farmer. In General almost all the lands of the farmers (55,5%) are concentrated in the farms area of 2-10 ha (Fig. 1).



**Figure 1. Grouping of farms by size of agricultural land**

Source: constructed according to [1].

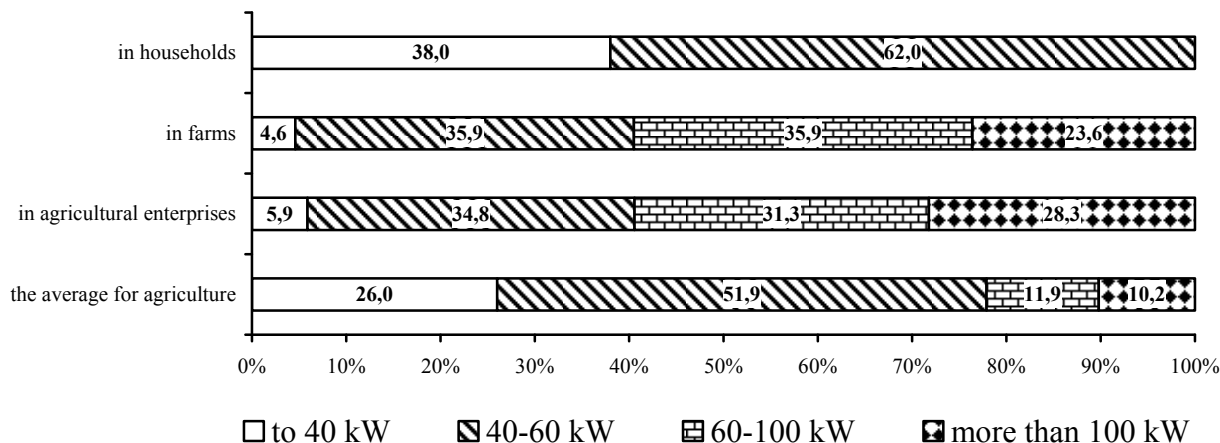
The average for Poland on one farm that carries out agricultural activities have 1 tractor. In 2013 the average area of agricultural land per

tractor 1 was about 10.0 hectares. In Ukraine, unlike neighboring state lands burden in house-

holds of 1 tractor (including compact and motor blocks) twice.

The presence in the Ukrainian agriculture of various forms of management brought about changes in the structure of the available tractor power (Fig. 2). Power tractors and their equipment primarily depend on the size and trends of agricultural production, the level of development and the level and forms of mechanization.

Smaller farms, which constitute the overwhelming majority of the total number of households equipped tractors less power with the possibility of widespread use, as in the field and transport work. Tractors more power, equipped with modern technical solutions are used, usually in large farms for the combined field work [4].



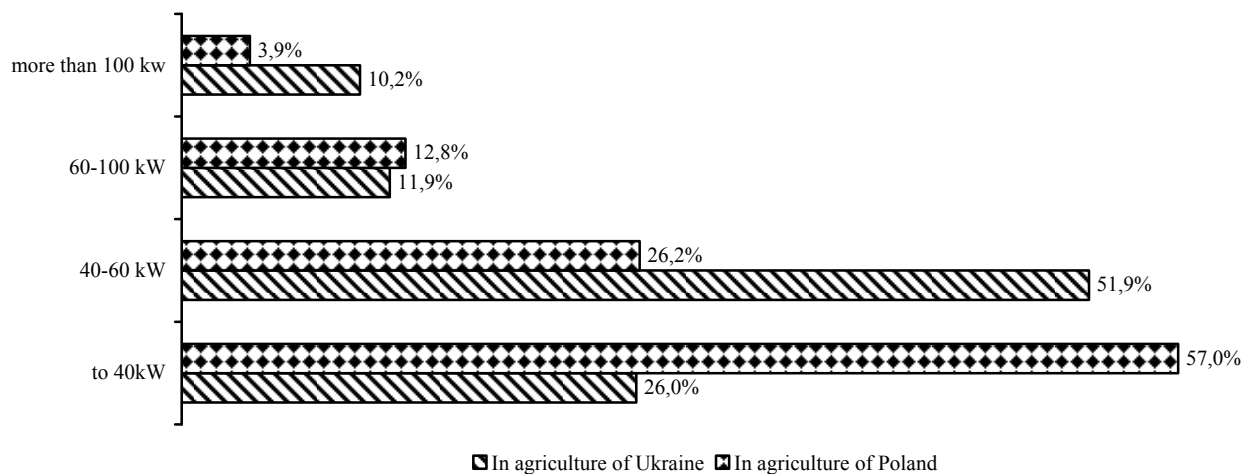
**Figure 2. The structure of power tractors of Ukraine for various forms of management**

Source: constructed according to [4].

Thus, households are mainly used compact tractors up to 40 kW) and tractors middle class (60 kW). In agricultural enterprises and farms, despite their size, the use of small equipment is impractical. They are characterized by the use of tractors, medium-class and high-power.

With an overall decrease in the number of agricultural farms in Poland, most of them dominated by tractors up to 60 kW (Fig. 3). In 2013 they amounted to 83.2% of the total num-

ber of tractors. In Ukraine, this figure amounted to 77,9%. Notable changes for Ukraine happen to other agricultural producers in the direction of increasing the number of tractors of medium and high engine power. In agricultural enterprises, observed an increasing number of tractors and their power with a tendency to increase their number and capacity together with the increasing size of land plots.



**Figure 3. The share of tractors of engine capacity in 2013**

Source: constructed according to [3; 8].

In Polish agriculture a significant impact on the current status of farms in agricultural machines are changes in the production structure of farms, technical progress and their economic status. In addition, since 2004 the modernization and adapt them to the EU standards allow for funds received under the common agricultural policy of the European countries. For a more detailed study of the technical and technological

equipment of rural households in Ukraine and Poland in 2013 provides data on the availability of farms engaged in agricultural activities. In the period from 2010 in Poland there has been a significant increase in equipment farms, including: trailers (22.3%), garden sprayers (21,9%), grain harvesters (8.2%), balers (6.9%), loaders-excavators (2.1%), and mowers (2.0%) (table 3).

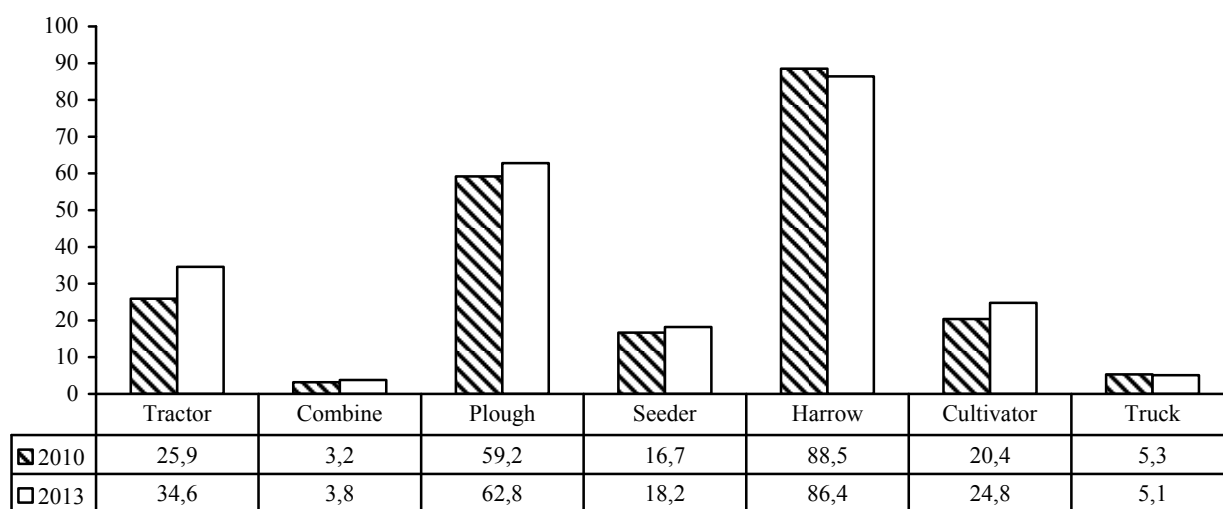
**Table 3. Equipping farms in Poland, which carry out agricultural activities**

Name of machinery	Farms with machine		The number of agricultural machines	
	2010 p.	2013 p.	2010 p.	2013 p.
Combine harvesters	147188	159333	152140	164598
Potato harvesters	78871	69582	79885	70614
Beet harvesters	27302	23183	27829	23624
Forage and other harvesters	11068	8395	11831	8998
Spreading fertilizer and lime	553170	554202	575452	574818
Manure spreaders	474638	464825	486035	476082
Mowers	494754	502838	512978	523260
Loaders-excavators	216849	225111	241948	247064
Potato diggers	370760	287849	372299	289913
Planting potatoes	349625	300486	351836	302749
Trailer	92715	108431	96298	117737
Balers	187787	201931	198239	211867
Field sprayers	486672	458390	495742	468182
Garden sprayers	46308	55044	51836	63165

Source: formed according to [8].

Unlike the Polish Ukrainian agrarians provided agricultural machines much worse. Today hardly there in Ukraine households that own potato, beet or forage harvesters. The same situation is with manure spreaders, field and garden sprayers. The provision of agricultural machinery Ukrainian households dozen times behind compared to Poland. Thirty-five tractors

per thousand households and a minimum set of attachments, here are the realities of the Ukrainian village. In Poland since 1433 thousand farms that carry out agricultural activities only 2.5% of households, i.e. 35 thousand units that do not have agricultural machines and devices. In Ukraine, only 15.8% of households have at least some technique (Fig.4).



**Figure 4. Availability of equipment in private households Ukraine, 1,000 households, pieces**

Source: constructed according to [2; 3].

The analysis showed that the main supply of agricultural machinery and agricultural implements at a minimum. This is due to the underdeveloped market for mini machines and low purchasing power of Ukrainian farmers. According to the Ministry of Agrarian Policy and Food of Ukraine in agriculture for over 70% of agricultural machinery, which operated for more than 15 years. Modernization of machine-tractor Park is extremely slow. Troubles technical support lead to the violation of the technologies of production, increase of loss, cause of technological backwardness.

Poor quality ukrainian technique makes it impossible to implement innovative technologies and move to a higher level of domestic agriculture. Family farms in Ukraine need small technique (mini-tractors, tillers, small mowers, sprayers and so on). It is mainly used seasonally, so when evaluating its effectiveness preference should be given no criteria use machines system and the level of mechanization and automation of processes, timeliness of manufacturing operations, the degree facilitate labor and reduce its costs, increase productivity, increase production. In the coming years, house-

holds will be transformed to enterprises higher group sizes of the earth in the process. Given the financial opportunity, they will use mostly domestic machines and foreign - those that were in use

Conclusions. In Ukraine at a sufficiently high level of availability of agricultural land and labor resources remains unresolved issue of its technical and technological equipment, especially small and medium size farms. Industry average level of equipment is 1 ha of agricultural land farms and farmers in Ukraine in 7-9 times lower than in Poland and other developed countries. Due to such a low level of technical support part of the harvest is lost at different technological stages.

Agricultural production of Ukraine requires technological re-equipment of domestic high-performance, reliable and energy-efficient mini-technique, which is still not produced in Ukraine; the reproduction of the technical potential of agro-industrial complex to the level of technological needs; state support for the development and production of modern technical tools for small business forms, including family farms.

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**The article has been received 04.09.2014**

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