IOP Conference Series: Materials Science and Engineering

PAPER • **OPEN ACCESS**

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To cite this article: N F Kashapov *et al* 2019 *IOP Conf. Ser.: Mater. Sci. Eng.* **570** 012047

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IOP Conf. Series: Materials Science and Engineering **570** (2019) 012047 doi:10.1088/1757-899X/570/1/012047

The state of the technical level of domestic agricultural machinery

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Abstract: Comparative tests of domestic and foreign equipment designed for carrying out soil tillage and sowing, plant protection techniques and the application of organic and mineral fertilizers under the conditions of compliant regulatory documentation, carried out in recent years, have shown that by basic technical and economic and agrotechnical indicators domestic technology is not inferior to foreign counterparts and may well replace them in a crisis relationship.
It has been shown that it has been carried out in recent years under the conditions of the regulatory documentation, It was shown that technical indicators of domestic equipment were not affected by the equipment.

Modern agricultural production is impossible without technology that goes to agricultural producers through the market. In recent years, a significant share of the Russian agricultural machinery market was taken by foreign firms, which led to an increase in the number of foreign machinery in the countryside. Imported equipment is poorly adapted to work in our conditions, often fails and requires the purchase of appropriate consumables, over time there is a need to replace units, purchase spare parts. In addition, prices for spare parts are quite high. In connection with the foregoing, the import substitution of foreign agricultural equipment, as well as its units, spare parts and consumables is an urgent task under sanctions.

In the Russian Federation, large and medium agricultural holdings, small agricultural enterprises, peasant farms (peasant farms), individual entrepreneurs, personal subsidiary farms of individuals (private farms) are engaged in agricultural business (Table 1).

Table 1 - Agricultural organizations of all forms of ownership engaged in agribusiness in the Russian Federation

Farm categories	Number of objects	Area of agricultural land, ga	The proportion of the area sh land in this category of farms, in%
Large and medium agricultural organizations	27779	3867	64,1
Small agricultural enterprises	20404	1201	14,6

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Subsidiary farms of non-agricultural organizations	19649	183	1,2
Peasant farms	253331	85	12,9

The largest number (64.1%) of the share of agricultural land is occupied by large and medium agricultural holdings, the other categories of farms are significantly inferior to them.

The availability of agricultural equipment available in farms of all forms of ownership (Table 2) also has a big difference: in personal subsidiary farms and other individual farms of citizens of tractors - 37% of the total, tractor mowers - 61, tractor plows - 36%; in farms and individual entrepreneurs of tractors - 14%, tractor mowers - 12, tractor plows - 22, combine harvesters - 28%; in large and medium-sized agricultural organizations of tractors - 40%, tractor mowers - 22, tractor plows - 34, grain combine harvesters - 59%.

Table 2 - Availability of agricultural equipment in farms of all forms of ownership in the Russian Federation

Farm categories	Tractors		Tractor mowers		Tractor plows		Combine Harvesters	
	number machines	share of all%	number machines	share of all%	number machines	share of all%	number machines	share of all%
Large and medium agricultural organizations	437752	40	49434	22	120341	34	112208	59
Small agricultural enterprises	73421	7	9144	4	24337	7	21821	11
Subsidiary farms of non-agricultural organizations	19649	2	2256	1	6488	2	4002	2
Peasant farms	158827	14	27375	12	76794	22	54037	28
Individual entrepreneurs	411863	37	132065	61	122860	35	-	-

As can be seen from Table 3, the average load of arable land on one tractor, the area of grain crops per one combine harvester, is greatest in small farms, large and medium agroholdings and peasant farms.

Table 3 - The load on agricultural machinery in farms of all forms of ownership of the Russian Federation.

Indicators	Large and medium agricultural organizations	Small agricultural enterprises	Subsidiary farms of non-agricultural organizations	Peasant farms Individual entrepreneurs
The load of arable land on one tractor, ha	153	194	60	105
It is necessary to plant (plant) the corresponding crops for one combine, ha:				
grain harvesting	257	231	118	167
corn harvesting	259	418	198	238
potato harvesting	30	45	62	40
Beet-harvesting (without topper)	129	140	95	96

According to the “Strategy for the development of agricultural engineering for the period up to 2020”, for the effective management of agribusiness in the countryside, the tractor park should be about 610 thousand units, and grain and forage harvesters no less than 147 thousand units. A separate

subprogram "Agricultural Engineering, Food and Processing Industry" includes the provision of agricultural producers, food processing and processing industry with reliable high-performance agricultural machinery, equipment to reduce overhead costs, as well as capable of working on modern waste-free, energy-saving technologies, which in turn is efficient will affect[1].

Agricultural machines in the field perform a large number of technological operations aimed at changing the state of processing objects. Therefore, the absence of one or another type of equipment violates the performance of the necessary cycle of technological operations for the production of agricultural products. The system of agricultural machinery used in the late 90s. It included about 3 thousand names of agricultural machines and implements, their modifications and devices, which took into account the zonal principle of agricultural production.

At present, the market of agricultural machinery and equipment in the Russian Federation, as well as throughout the world, is mainly oligopolistic, i.e. It has a limited number of large manufacturing enterprises. At the same time, it is changing, since buyers have an unlimited choice, for example, the possibility of acquiring agricultural equipment produced by regional enterprises, as well as analogues from near and far abroad [2].

In order to import substitution in the Russian Federation, mechanisms are being used to support the renewal of the agricultural machinery park through the State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food Markets for 2013-2020, the subprogram “Technical and Technological Modernization, Innovative Development”, the main event “Renovating the Park agricultural machinery "(subsidies to producers of agricultural machinery for reimbursement of the cost of production and real zatsiyu agricultural machinery); financial lease (leasing) through Rosagroleasing OJSC and other leasing companies; credit programs of OJSC “Rosselkhozbank” and other banks; special programs of enterprises that provide discounts, increase the warranty period, etc .; recycling programs; regional programs, including the subsidization of part of the costs of agricultural producers for the purchase of equipment from regional budgets [3].

Considering the global tendencies of the widespread use of direct-seeded seeding complexes, modular modular units and machines for applying liquid organic fertilizers, anhydrous ammonia, and liquid complex fertilizers, it is advisable to start their production at plants in the Russian Federation[4,5,6,7,8].

The analysis has shown that domestic combine harvesters of various classes are at the level of foreign ones or somewhat inferior in terms of specific technical level indicators. However, they have a clear advantage in the implementation of different options for harvesting non-grain parts of the crop, and they are preferable by the price-performance criterion. The payback period of domestic combines is 2-3 times less than foreign ones, since their cost is lower (by 1.5-1.8 times) and the prices for spare parts (by 5-6 times). Foreign combine harvesters are effective in harvesting crops with a yield of more than 30 c / ha, but the areas with such a yield in Russia are less than 20%. Domestic harvesters are suitable for work in all climatic zones. They are more effective in harvesting wet, long-straw and weedy breads, the cost of harvesting grain crops is 20-30% less. Therefore, the potential for import substitution of foreign combines can be assessed as sufficient.

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