Features of Machine-Technological Stations Organization in the System of Agro-Industrial Production

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Abstract. The creation of modern machine-technological stations (MTS) causes a lot of disputes about the effectiveness of their operation. The majority of MTS are commercial enterprises, independent of services consumers, which, in the conditions of decreasing equipment availability of agricultural producers, turned out to be monopolists comparing with them. Agricultural enterprises could not become founders of MTS and do not have the ability to influence on the activities of service enterprises directly. The efforts of the stations are greatly aimed to get their own profit and much lesser to increase the efficiency of served arms. Many experts have the opinion that the achievement of economic well-being of MTS often is due to the decreasing of the economy of services consumers. As a result of the direct economic effect of the MTS activity - the profits of agricultural producers are not yet available. The reason of this, in our opinion, is explained by the fact that the relations of stations are not connected with final results of agricultural production. The efficiency of their functioning will become economically viable only when their own profitable activities ensure the effectiveness of services for agricultural producers. The purpose of the research is to justify the need of creation machine-technological stations in the system of agro-industrial production.

1. Introduction
The need to improve technological processes control through the system of technological availability of agricultural production nowadays must be aimed to include formation, development and operation of infrastructure units. It is possible to solve this complex problem through the creation or restoration of machine-technological stations, where there are all the prerequisites for the complete support of the technological process. According to agricultural scientists and managers of the agro-industrial complex, it is necessary to continue the creation of the productive-technical structure in the countryside - machine-technological stations (MTS), which are to provide real assistance to agricultural producers to increase the efficiency of agricultural production [1].

As a result of methodologically unprepared and hurriedly carried out market reforms, the technical equipment of agricultural production dropped to a critical point. Nowadays the equipment of agricultural production enterprises with tractors is under 50% of the standard, combine harvesters - under 60% and is in 3-5 times lower than in the countries where the growth rates of agricultural
production are statistically visible. Moreover, about 40% of tractors and more than 30% of combines crossed the limits of the standard service life, which means that their reliability in production, especially in technologically complex periods, is low. Due to this reason, as well as due to the fact that the loads on the machines have increased, the need for repair and update of machines and tractors fleet has been increased [4].

2. Methods
The current technical potential of agriculture in the country does not fit the requirements of modern agrarian production. In this situation, agricultural producers cannot qualitatively provide the production process, and as a result, agricultural work is delayed and production losses increase. As for the organizational forms of MTS [7], they should be considered in the framework of transformation processes that take place in the economy of the Russian Federation. Prospects of agriculture development nowadays are associated with the formation of such large integrated structures that could control the production process, the work of intermediaries and independently carry out marketing [8] activities. Some trends in the village development are due to the intensification of the activities of the households. Their part now accounts for more than half of the produced agricultural products. The reasons constraining the development of small business are: the lack of guaranteed purchases of agricultural products; insufficient financial position for the purchase of high-quality seed, elite cattle, feed, fertilizers and toxic chemicals; lack of equipment and proper equipment. It can’t be taken into account the low productivity and hard physical labor. In the situation that has developed in almost all regional agro-industrial complexes of Russia, MTS should be considered as a mean of compensation of technical and technological potential shortage of agricultural production [6].

Graph-analytical analysis with the use of geo-information technologies, which allow to harmonize the environment of the area in the process of transforming its planning structure in the temporary development, was used in the research.

3. Main part
It should be emphasized that at the very beginning of MTS creation there was no certain opinion about the expediency of their organization and the concentration of complex equipment in them. Agricultural cooperation representatives considered that complex machines should be transferred directly to collective farms. By 1941, 7069 machine-tractors stations had been established. They served 200 thousand collective farms and processed 94% of their acreage [3].

The largest number of MTS was registered in 1956 - 9094 ones. At that time they served more than 81.1 thousand collective farms. On the average the station had 74 tractors, 31 combine harvesters, 10.5 trucks and a typical repair station. The number of MTS staff was about 346 people. Such enterprise carried out a volume of work exceeding 59 thousand hectares of plowing per year. Summing up the activities of the first generation of MTS, it can be stated that they played an extremely important role in the establishment and development of agricultural production [4].

In countries with the developed agricultural production, the main organizational form of which are farms and their cooperatives, there is a well-structured and effective system of their production services. This system consists of a subsystem for equipment providing on the basis of sales and rental, leasing, selection and sale or replacement of spare parts, subsystems for repair, technical and after-sales service of tractors and agricultural machines, buying and selling of used machines, agrochemical, tractor-transport service. In the USA it is prohibited to sell agricultural machineries without organizing their technical service for a long service life. A lot of companies, specialized on the equipment rental on quite favorable terms for farmers, have been organized. In Canada and the United States, farmer cooperation was widely developed. They may be members of one or more cooperatives in logistics, maintenance, production and marketing.

In Western Europe, the organizational forms of sharing and using machines by farmers are divided into three types [2]:
1. Partnership of farmers who own equipment and perform mechanized work for each other. In such associations, all or most of the machines are owned by the shareholder farmers.

2. Cooperatives of farmers (machine syndicates) for equipment purchase and use on share principles.

3. Cooperatives for providing repair-technical services for farmers, for renting cars and carrying out mechanized work, the purpose of which, unlike the first two forms, is to extract profits. Such cooperatives are equipped mainly with highly specialized equipment for operations that are not a part of the basic technology of growing crops. Cooperatives of farmers sharing equipment are widespread in Germany. Farmers create them in order to use rationally, to maintain and repair equipment properly, to save investments and current costs. In agriculture in Austria, the inter-farm use of machinery, based on the voluntary association of farmers-owners of different machines, was developed mainly among small farms of 5 hectares area. Such farms account 1/3 of the total in all associations. Cooperative forms of equipment using have been widely developed in Scandinavian countries. In Sweden, the majority of farms are united in cooperatives, within the framework of which they resolve problems of technical supply, equipment using, organization of its maintenance and repair [5]. In Norway and Denmark, mechanization enterprises of various kinds of work on a contract basis are spread. Contractors are farmers or others who own equipment specifically for use outside of their landowing.

They are mainly engaged in the development of new lands, land melioration, road building, and planning works. In England, the joint use of equipment is less developed than in other Western European countries, which may be related with the size of farms (the average farm area is 120 hectares, whereas, for example, in Austria - 24 hectares). However, their number is growing.

Summing up, it is necessary to note that progressive ideas, successful practical solutions of the organization of machine-tractor and machine-technological stations, other organizational forms of concentration of production and centralized service of rural producers, were found and implemented in foreign countries.

In Russia in the foreseeable future, it will not be possible to equip each farm with equipment in such quantities that it could independently cultivate all lands and carry out all field cultivation in the required volume and without violating the established technology. But even if plants could produce a sufficient number of machines to get agriculture from a technical and technological impasse, the farms, due to the difficult economic situation still cannot update machines and tractors fleet and carry out it repair and maintenance services in time and in the required volumes, because the creation of peasant farming led to the collapse of enterprises with a sufficient number of staff and the possibility of their specialization in a certain type of work, which peasant farming cannot afford, where several family members do all the work themselves [2].

These facts indicate that the current situation in agriculture is very similar to the one that developed in the late 20s and early 30s. Nowadays, like those days, the problem of increasing of technical equipment level of agricultural production is extremely acute, but the financial resources of the farms and the state, which are necessary for its solution, are extremely limited. Moreover, the volume of production of agricultural machinery is obviously insufficient.

Nowadays, scientists and specialists studying the use of the land concern about the growing dynamics of negative processes leading to worsening and decreasing of the efficiency of land use, which is the basis of Russia's national well-being. Scientists note that only in the Chernozem Zone (the most valuable land), square of arable land with negative features during the last 10 years has increased by more than 3.5 million hectares, product losses in grain equivalent on average per year 10 million tons; land cadastral value decreased on 30% or 7 trillion rubles.

Changes affected each region greater or lesser. During the last 10 years the Central Federal District lost 4.05 million hectares of farmland, including arable land 1.9 million hectares, forage lands 1.8 million hectares, perennial plantings 163.8 thousand hectares. For the Nonchernozem Zone, the results of land transformations became worse - 2.8 million hectares or 70% of the total area of lost land in the Central Federal District were derived from farmland, arable land decreased on 1.3 million hectares (10%), and feed lands on 1.35 million hectares (23.5%) [10].
This circumstance significantly influenced the state of cattle breeding and led to the loss of development potential. The following regions were affected most of all: in the Chernozem Zone it is the Kursk region, 339.5 thousand hectares were taken out of circulation, including arable land of 138.9 thousand hectares, in the Voronezh region 263 thousand hectares, arable lands of 148.4 thousand hectares.

In the Nonchernozem Zone, losses in the Moscow region amounted about 448.2 thousand hectares, including arable land of 258.2 thousand hectares, in the Smolensk region - 367.3 thousand hectares, including arable land of 200.3 thousand hectares and 148.5 thousand hectares of forage land (Figure 1).

This situation is in the Nonchernozem Zone of the Central Federal District - 40.53% of arable land in the total area of arable land is not used, and only 50.43% can be put into turn over. From the regions of the Nonchernozem Zone, the Smolensk region has the largest areas of unused arable land, and as a result of the degradation, only 38.54% is possible for resuming their use in agricultural production.

According to the Ministry of Agriculture of Russia, due to the lack of equipment, about 4% of the crop productivity remains on the fields every year, another 11% is lost due to its imperfection. As a result, the actual crop productivity is significantly lower than it could be.

4. Discussion

The production parameters and the organizational-economic mechanisms of the most already established MTS require serious changes, because they are not a part of the agricultural production system in the regional link of agro-industrial complex. First of all, this refers to the number and kinds of the machines and tractors fleet. Among the organizational and economic mechanisms, it should be changed the mechanisms from which the degree of integration of MTS with rural producers and other members of the agro-industrial production, the closeness of their interests and the equivalence of exchange-distribution relations are depended [11].

The number and kinds of machines and tractors fleet of the majority of MTS do not correspond to the needs of rural producers either in volume or nomenclature. The reason is that it was formed not according to these needs, but spontaneously, mainly from those machines and tractors which were in the base of the enterprise before or were managed to buy or to be leased. As a result, machines and
tractors fleet of a lot of stations are a casual typed set of equipment, with the help of which you can perform only a limited number of works, and not all the operations of the technological cycle.

So, in MTS, created on the basis of district enterprises for agrochemical maintenance, are mainly fertilizer application machines and their delivery to the fields. The machine and tractor fleet of stations, organized on the basis of repair and technical enterprises, in which mechanized units were included, is equipped with appropriate machines. If a mechanized unit specialized in harvesting fodder, these are fodder harvesting machines and vehicles, and if in harvesting grain crops, then it is mainly combine harvesters, reapers, etc. It is clear that the machine fleet of the MTS, formed in such way, can’t do the full range of mechanized field work that the farms would like to order [9].

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