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HIGHER UTILIZATION OF AGRICULURAL MECHANIZATION THROUGH ORGANIZING MACHINE RING ASSOCIATIONS

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ABSTRACT

During the 1990s, turbulent processes emerged in the Balkans, conflictss, economic crises, where most affected was agricultural production and farmers. During that period, there were still large factories, the so-called Agricultural-Industrial Combines, which had 70% of the arable land. At the time of the transition, most of those plants collapsed economically, agricultural machinery was sold at auction, the land was divided into tenders, the areas were shrunk and a process was gradually started in which everyone wanted to be a farmer. Agricultural machinery, although purchased new, with insufficient number of effective working hours during the year had a high cost per machine working hour. It has emerged as a result of large service outages, overhaul, and maintenance of tractors on the one hand, but also small agricultural parcels and small production on the other. High costs contribute to high production prices of the agricultural product. Although small farmers have a small volume of work, they still buy and purchase new propulsion machines, the purchase of which made them even more indebted, instead of organizing and jointly procuring what they need and thus enabling rational agricultural production. Therefore, through this scientific paper, we have analyzed everything that farmers can get, and what to lose if they are organized in tractor cooperatives (machine rings). Through surveys and recording the actual situation on the ground, we gained a realistic picture of the situation with our farms, and what it should be like.

KEYWORDS: Agricultural mechanization, exploitation, machine cooperatives, machine rings.

INTRODUCTION

If the situation in R.N. Macedonia is analyzed on the basis of arable land and the number of tractors, there will be noted that there is no proportion between these two important factors for agricultural production. The figure of 60,000 different types of tractors with different traction power is characterized by a great variety of models and manufactured in different countries and from different companies. Currently in the Republic of North Macedonia there are about 80 different companies as producers of agricultural machinery. Such a great variety does not give any sign of their typification and categorization, because the entire mechanization is from import and there is no possibility for proper maintenance, service and repair (Davcev at al., 2004)

The training of agricultural machinery operators, as one of the important factors that has not been observed in the past, nor professionally guided, will see the creation of major problems and frequent delays due to unprofessional handling, and which stalled not only disrupt production technology but also they also generate large cash outflows in the exploitation of agricultural machinery. This is perfectly normal because unprofessional handling often creates and leads to the deterioration of agricultural machinery, whose expenditures directly increase due to the fact that machines are imported and require large cash expenditures for spare parts.

Modern agricultural machinery, which nowadays abounds with modern devices and mechanisms commanded semi-automatically or automatically, ie where most of the measuring instruments are guided and regulated electronically give great opportunities for their precise regulation, which allows the device to perform properly and with quality role. Such a construction brings and imposes the need for professional training of the staff for proper handling and maintenance, which is an immediate condition to avoid frequent delays. This leads to the need for organized procurement of agricultural machinery through machine rings (Artz & Naeve, 2016).

MATERIAL AND METHODS

Based on surveys conducted in different regions among individual farmers, a clear picture was obtained where our farmers are at the moment, with agricultural land, agricultural machinery, their age structure, how much is the total cost during the vegetation, annual maintenance, service and overhaul, and of course during the results and discussion we will pay special attention to what can be done to improve their status and of course improve their production. The purpose of sublimating

and collecting data as well as their processing in the scientific paper itself is to give a clear direction on how they can be organized and what they can get if farmers are organized in machine rings.

RESULTS AND DISCUSSION

Based on the realized methodology and the summary condition per farmers, the results showed that two thirds of the land under agricultural crops owned by farmers do not exceed 2 hectares. For the same area they use a drive machine with an average power of 25 kilowatts, which is an expensive machine during its exploitation, non-competitive agricultural production, no economy during operation, higher fixed costs than variable after the growing year and so on. This real situation in which our agricultural producers find themselves, it is necessary for them, especially with small areas, to invest more in raw materials, than in mechanization, because it is unused, and is an additional high cost item. It is necessary for farmers to work primarily on mutual trust, and to think in the direction of forming machine rings (Davcev at al., 2004)

This process imposes itself as a necessary need because it has the following advantages that we will present in a few points to better explain the idea of their formation:

1. Optimization of the traction power in kilowatts according to the arable area in hectares;
2. Rational use of agricultural machinery;
3. Economics at work;
4. Timely execution of work processes;
5. Reduction of expenditures for procurement of agricultural machinery;
6. Enabling and constant procurement of new machinery;
7. Continuous introduction of new production technology;
8. Typing and categorization of the machine-tractor park;
9. Fulfillment of immediate conditions for proper functioning of the machine-tractor ring.

1. The formation of machine-tractor rings will optimize the traction power of the drive machinery in KW per hectare. From a professional point of view, this is a very important factor, because the engagement of the increased number of KW per hectare can lead to an increase in the price of the labor process, which means a direct increase in the total production technology or higher production price per kilogram of agricultural product. The current situation in our conditions is 12 to 13 KW of traction power per hectare. Such an analysis is valid for as long as 660,000 hectares of arable land are fully cultivated. Knowing the fact that in the last few years not all agricultural

areas are cultivated for various reasons, this means that on arable land we have more traction than kilowatts of power plants, which gives our agricultural production the character of extensive agriculture.

This problem in both agriculture and agricultural technique is scientifically and professionally solved with the provisions of the EEC where in today's conditions in the field production, there is a traction of one kilowatt per hectare, and in the vineyard - fruit growing 0.8 kilowatts per hectare. area, which compared to our condition is about 15 times less, knowing the fact that developed countries have intensive agricultural production.

From this aspect, the mentality and understanding of the agricultural producers, who bought tractors and connecting machines from the need for independence of the work processes, and not taking into account that they will use them on a small agricultural area, but because they are not, also participated as a factor. defined the interrelationships between agricultural producers and if his neighbor took a tractor, for example 25 KW, but for an area of 2-3 hectares.

With the formation of machine-tractor rings and the establishment of healthy mutual relations led by experts, this unfavorable relationship of installing traction power will be slowly eliminated, and over time and years of operation we will slowly get closer to the optimal level of 1KW traction. power per hectare area (Davcev, 2007)

2. The rationalization in the use of agricultural machinery can be improved by joining a larger number of agricultural producers in the application of propulsion and connection machines. Such an association is made up to the limit of observing the optimal parameter 1KW per hectare area. This means that no matter how the tractor is procured, which model but also which model to perform such an association, the optimal traction power should be observed. This will lead to the constant engagement of the drive and connecting machines and the preparation of a larger number of working hours by them during the vegetation year.

3. The economy in the work will certainly be greatly improved by the organized and professional operation of the machine-tractor ring. The economy of operation of the drive machines can be achieved only as long as we have direct engagement from about 800 to 1000 working hours during the year. If the number of effective working hours increases to such an extent, its labor costs per hectare will decrease. Therefore, with the formation of machine-tractor rings and with the increase of the number of working hours, it is realistic to expect cheaper cost of working hours, ie more economical production.

Table 1. Height of costs from the use of tractors and change of their structure depending on the number of working hours

No of work. h	Total expenses		Hourly expenses		Structure of expenses %	
	UT = vg + F	*Index*	*T= v + F / q*	*Index*	*Variable cost*	*Fix cost*
500	184504	100	36901	100	45	55
750	228596	124	30479	83	56	44
1000	272684	148	27268	74	63	37
1250	316774	172	25342	69	68	32
1500	360874	195	24058	65	72	28
1750	404974	219	23141	63	75	25
1850	422591	229	22842	62	76	24
2000	449064	243	22453	61	77	23
2250	496226	269	11056	60	91	49
2500	546349	296	21854	59	92	8
2750	596456	323	21678	58.7	92.3	7.7
3000	646514	350	21550	58	93	7

4. Timely execution of the work processes will be consecutive as a result of fulfilling the previously set goals in items 1, 2 and 3 which are the basic initial condition in the organization of machine-tractor rings. Of course, when the machine-tractor ring is professionally equipped and it is managed by a seasonal program expert with a daily and weekly schedule of engagement of agricultural machinery, it is quite expected that all work processes of certain agricultural crops will be performed on time, and of course qualitatively. This is one of the most important factors in the functioning of machine-tractor rings because that is the nature of seasonal work processes.

5. Reduction of expenditures for procurement of agricultural machinery is a problem that is directly related to item one. It is due to the absence of machine-tractor rings and the absence of cooperative relations among agricultural producers (Davcev, 2007). The individual procurement of propulsion and connection machines exhausts the agricultural producers to the maximum because in the absence of credit lines during their procurement they are forced with cash to buy agricultural machinery, and so the large amount of money later not only is very difficult to return but also exists. great risk posed by agricultural production itself.

By pooling the funds of two, three or more agricultural producers who grow the same agricultural crop, an adequate propulsion and adequate connection machine can be procured, and at the same time how many of them will be united and their costs will be reduced by that much.

6. Permanent procurement of new machinery arises from the increased engagement of machines in the machine-tractor ring. From a professional point of view, every agricultural machine should be spent after 9000 working hours, because it is considered to be the optimal of its service life with which it can provide timely and quality and economical work. This is exactly the purpose of the establishment of the machine-tractor rings, which we explained in points 2 and 3, where it was emphasized with the spreadsheet that the mechanization with such associated funds will perform a large number of working hours during the year. Such a form of engagement will lead to a faster achievement of the fulfillment of the moment of expenditure of agricultural machinery and a moment of decision to purchase new machinery (Davcev, 2007)

7. As a result of the presented expert procedures in the previous point and with the constant procurement of new mechanization, it is quite expected that with its introduction on the agricultural areas, new production technology will be launched. The basic rule, which shows the modernity of agricultural production, depends on the degree of modernity of the agricultural machinery used. Such a tendency is an integral part of all modern agrarian policies and development programs because it is a basic condition for the realization of agricultural production, in market conditions. The introduction of modern production technology is constantly carried out on certain agricultural crops, only if modern technical solutions are applied. The fulfillment of this condition can only be achieved by forming machine-tractor rings and laying a solid foundation for their proper functioning.

8. Typing and categorization of the machine-tractor park is one of the most important issues that with the formation of machine-tractor rings can be solved on a professional level. With the establishment and proper functioning of the machine-tractor rings, a line of machines powered and connected by a certain company will be procured, and after automation, the solution of this problem will come by itself. From a professional and applied point of view, solving this problem has a great advantage because we know that agricultural machinery is almost 90% imported, which means that our agricultural producers are subsequently directly dependent on the factory to provide consumables and spare parts. This in turn entails a great advantage in proper operation with minimal downtime of the machine-tractor ring.

9. There is a large number of fulfillment of the immediate conditions for revival in the formation and proper functioning of the machine-tractor rings. In this context, we will mention only the most important elements that need to be done in the initial phase, but also subsequently for their proper functioning, as follows:

- Education of agricultural producers;
- Propaganda of the idea of forming a machine-tractor ring

CONCLUSIONS

Current situation with our agricultural production: irrational utilization of agricultural machinery, on 1 hectare 12-13 kilowatts traction power, which represents high costs per hectare area, expensive machine working hours, over 50% of the production price of agricultural culture belongs to related costs with mechanization.

Organizing farmers in machine rings will contribute to a continuous process of development of both technology and technology, ie continuous renewal of both propulsion and connection machinery, development trends will be constantly monitored, achievements and costs will be reduced. (according to examinations below 30%) from the share of mechanization in the production price. The work processes will be performed in an organized, economical, rational, timely manner, and the agricultural machinery will reach the annual maximum number of effective working hours, which will enable the recovery of agricultural machinery in a short time, which is not the case today, because tractors are depreciated today. as a result of old age, not as a result of real effective working hours.

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