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STUDY ON THE STRUCTURE OF THE PARK OF TRACTORS AND AGRICULTURAL MACHINERY IN ROMANIA

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ABSTRACT

This paper presents a study on the dynamics of the tractors and agricultural machinery based on data provided by the Ministry of Agriculture and Rural Development and the National Institute of Statistics. There are, also, presented issues regarding new and used agricultural machinery market, and solutions to the renewal of tractors and agricultural machinery.

INTRODUCTION

In Romania there are almost 4 million farms, which means one third from the total number of farms in EU, the particularity of them being the fact that they are very small (according to Eurostat data). The large farms – of over 100 ha – have an insignificant share, of 0.3% of the total number of farms in Romania (13.700 of 3.9 million), the average in EU being much higher, of 2.7%. In agriculture work about one third of the country population and this sector is vulnerable, thye yields depending, each year, by the weather conditions. Eurostat data reveal the fact that the average surface of a farm is 3.4 ha in Romania, very small as compared with Great Britain (90 ha) and Czech Republic (152 ha). Though the average surface of a farm is small, in our country the farms of over 100 ha have an important share, of over 40% of the farming land.

In Romania, the statistics about machinery show a fleet of over 600.000 units, including tractors, plows, trailers, etc. Data from Ministry of Agriculture indicate that almost 75% of machinery overpassed the normal lifespan of functioning. As regard the annual trade of new machinery, the cumulated figure that includes tractors and combines add up about 3.000 unities while in large markets from western countries it reaches tens of thousands per year.

MATERIAL AND METHOD

This research is a statistical analysis of data regarding the tractors and machinery fleet for 1990-2014 period. The primary data have been taken from MADR and INS sites. These data have been statistically processed with the goal of observing the dynamics and the actual regional situation of the tractors and machinery fleet.

RESULTS AND DISCUSSIONS

Oltenia is one of 8 regions of development established at national level on the basis of Chapter 21 „Regional policy and structural coordination instruments”, in 2000 year, being a specific territorial unit without administrative status or legal personality, after European Classification of Territorial Units (ECTU), according with communitary aquis [7]. The South – Western Region Oltenia includes 5 counties: Dolj, Olt, Gorj, Mehedinti and Valcea [6] (fig. 1).

Fig. 1 – Counties of Oltenia Region (source: INSSE [6])

From data collected at MADR, at the end of 2013 year, in machinery fleet from Romania there were recorded 191.301 tractors, 24.622 combines for cereals harvesting, 152.031 plows, 92.118 disk harrows, 74.805 drillers of diverse types, 10.225 balers, 85.818 trailers for tractor, etc. (table 1, figure 2).

After an analysis of these data there can be concluded the following:

- ✓ In South – Western Region Oltenia there are recorded 24.5 thousand tractors;
- ✓ In Dolj and Olt counties there are, approximately 7 thousands tractors in every county and in every county of Gorj, Mehedinti and Valcea there are about 3.5 thousand tractors;
- ✓ About 71.3% of the total number of recorded tractors have overpassed the lifespan (payed off);
- ✓ The highest paying of degree with recorded tractors (over 80%) is found in South – Western region;
- ✓ In Mehedinti, Olt and Valcea counties the share of payed off tractors is over 85%;
- ✓ About 65.8% of the total number of combines for harvesting cereals have overpassed the functioning normal lifespan;
- ✓ The paying off degree of the combines fleet is over 69% in South – Western region yet in other regions from the country this figure is under the country average;
- ✓ The theoretical average load per tractor is of 49.10 ha arable/tractor;
- ✓ The theoretical average load per combine for harvesting cereals, at the peak of working period is of 108.80 ha/combine;
- ✓ The tractors of 61-79 HP range share is significant within the fleet (56.2%), followed by 45 HP tractor (24.5%);
- ✓ The estimated available power of the tractor fleet at country level is over 12.5 million HP (about 1.34 HP/ha arable). About 55.2% of the power is ensured by the tractors of 61-79 HP range.

Table 1

The situation of tractor and machinery fleet at 31.12.2013

County	Tractors	Combines for cereals	Plows	Machinery for spreading amendments	Disk harrows	Drillers for cereals	Precision drillers	Machinery for herbicide spraying	Balers	Trailers for tractor
Dolj	7419	1871	6335	305	4402	2249	2291	774	196	3339
Gorj	3483	393	2734	0	1741	469	726	270	60	840
Mehedinți	3516	550	2798	106	1980	832	950	150	20	1540
Olt	6603	1182	6130	805	3709	1978	1796	1130	282	2773
Vâlcea	3842	260	2393	24	1149	315	460	335	37	1198
South – Western region Oltenia	24863	4256	20390	1240	12981	8043	6223	2659	595	9690
Romania	**191301**	**24622**	**152031**	**9044**	**92118**	**36971**	**37834**	**24203**	**10225**	**85818**

(after INS data)

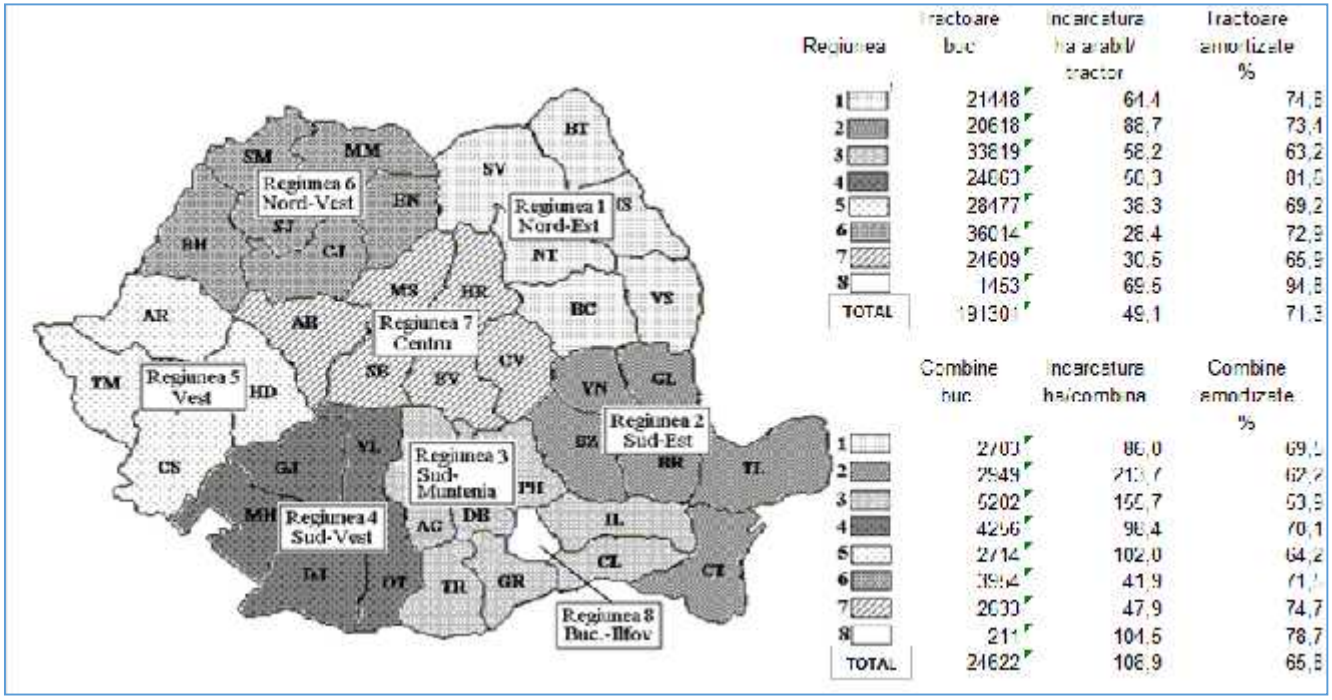

Fig. 2 Theoretical load per tractor and combine for harvesting cereals and the age of the fleet on regions at 31.12.2014 (http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=AGR103A)

Table 2

The comparative situation 1990-2014 of the tractor and machinery fleet

Region	Dolj		Gorj		Mehedinti		Olt		Valcea		South – Western Region Oltenia		Romania	
Year	**1990**	**2014**	**1990**	**2014**	**1990**	**2014**	**1990**	**2014**	**1990**	**2014**	**1990**	**2014**	**1990**	**2014**
Tractors	6200	7716	1515	3513	2832	3519	4744	6658	1701	3893	16992	25299	127065	193120
Plows	5213	6248	916	2750	1769	2798	3307	6174	992	2483	12197	20453	73159	156964
Cultivators	1797	1666	174	346	596	496	1472	616	152	112	4191	3236	27339	29562
Mechanical drillers	2010	4506	341	1215	780	1782	1686	3825	286	1461	5103	12789	35778	76301
Spraying and spreading machinery with mechanical driving	944	118	247	21	455	26	542	39	272	7	2460	211	14991	5315
Self – propulsed combines for cereal harvesting	2843	1256	393	410	852	550	1931	1318	276	244	6295	3778	40695	25694
Self – propulsed combines for fodder harvesting	191	23	62	-	101	-	186	5	59	5	599	33	5569	868
Combines and machinery for potato harvesting	109	5	34	1	44	-	20	2	17	1	224	9	2998	5122
Balers for straw and hay	1127	292	196	65	417	20	890	280	184	39	2814	696	21706	10871
Mowers for fodders	189	60	64	10	94		182	38	47	11	576	119	4981	1217

(Source: National Institute for Statistics)

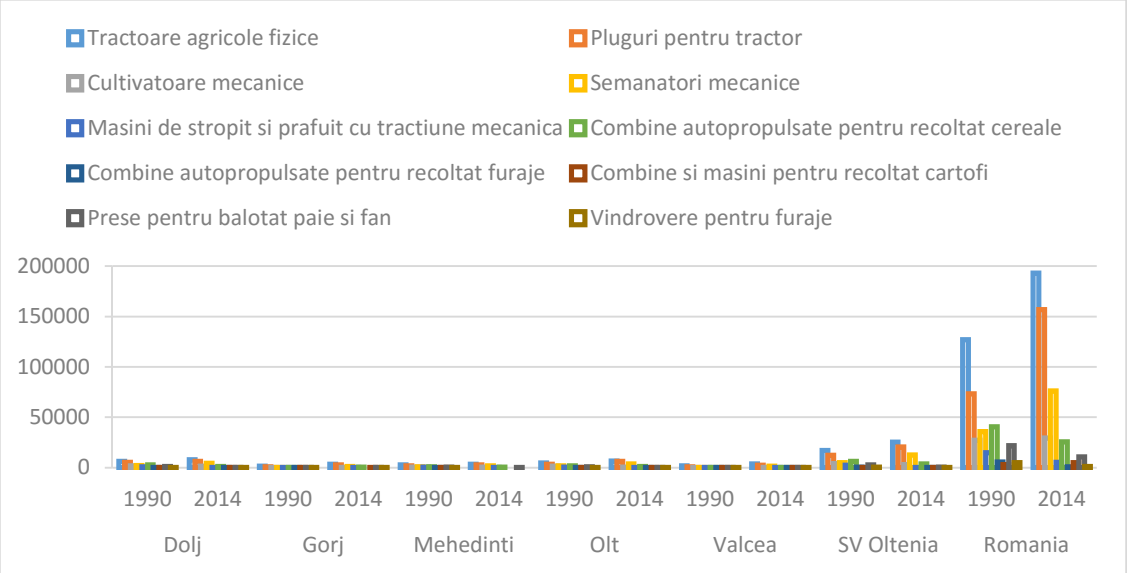

Fig. 3 Comparative representation 1990-2014 of the situation of tractors and machinery fleet.

According with a Kleffmann Group study, taking account all farms from Romania, only 8% have tractors, 1% combines and 4% drillers and spraying or spreading equipment. The differences between farms are evident: the large farms have a large machinery fleet as compared with small farms. If we exclude the farms under 3 hectares, the percent of farms that have machinery increases from 8% to 31% with the case of tractors, to 9% with the case of combines for cereals, 23% of farms with over 3 ha have drillers and 20% of farms have machinery for spraying.

The tractors are most found, both on small and average farms yet in large farms, too, major differences being recorded as regard the power. Though the farms with less than 3 ha have one third of tractor fleet – 90% of machinery have an age and a lifespan of over 10 years, being, already payed off. The number of combines from farms that have less than 30 ha is not significant.

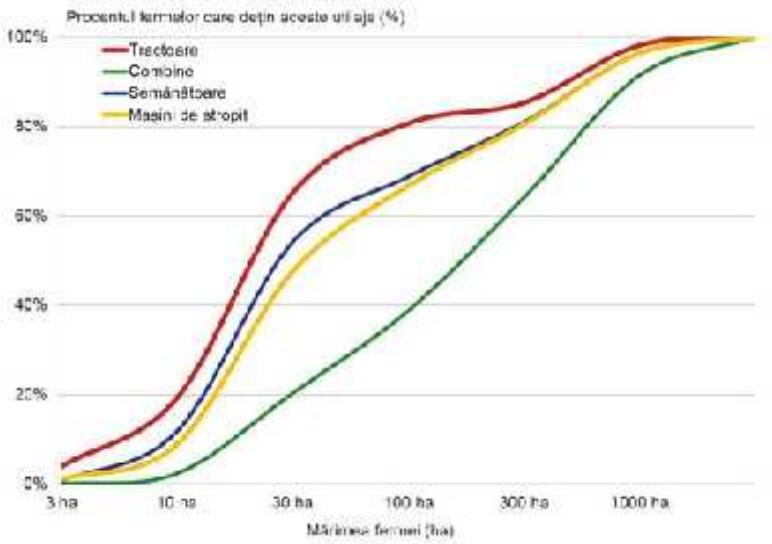

Fig. 4 Types of owned machinery – on farm size categories (source - Kleffmann Group study)

Though in the last years farmers have invested considerable sums of money from their own money, estate grants or credits for renewal the machinery fleet, in the present

time almost 80% of equipment in farms are older than 10 years. The investment in new technique has been made, especially, by large farms that have a high potential.

The following programs have included the help for farmers to buy new tractors, harvesting combines, machineries, equipment and accessories, software: SAPARD Program, European Agricultural Fund for Rural Development (EAFRD) (a finance opportunity for Romanian rural area, accounting about 7.5 billion euros, beginning with 2007 till 2013).

The 121 Measure „The modernization of farms" from PNDR has included eligible expenses, among many other, the acquisition of leasing of new tractors, harvesting combines, equipments, instalations and accessories, software which were identified as required by feasibility study. Also, there could be taken not reambursable funds for the acquisition of agricultural equipment by 112 Measure - „The settlement of young farmers" and 312 Measure „The creation and development of micro enterprises".

The program of stimulation of renewal of the national self – propulsed machinery fleet (Jalopy Program) – the funding is done by the Administration of Environment Fund and is unfolded annually, in the limit of sums provided with this destination by annual budget.

The most sold are the tractor whose price ranges between 30.000 – 50.000 euros and have engines of 60-85 HP. The market of new tractors in Romania is less than 2.000 units/year.

CONCLUSIONS

Analyzing the presented data, we can conclude:

- The almost 4 million farms in Romania (one third of European number of farms) have had at the end of 2014 year 193.120 tractors as compared with 127.065 units at the end of 1990. These tractors belong to several power classes. The estimated available power of the tractor fleet at country level is over 12.5 million HP (about 1.34 HP/ha arable);
- At the end of 2014 year there were recorded 25.694 combines for cereals, as compared with 40.695 units at the end of 1990 year. About 70% of the combines from Romanian farms have overpassed the function lifespan;
- The number of plows designed for bases tillage has increased from 73.159 units in 1990 year to 156.964 units in 2014;
- The number of precision drillers and for cereals has increased, also, from 35.778 units in 1990 year to 76.301 units in 2014;
- The funding programs from European funds yet the credits and grants have determined the renewal of tractor and machinery fleet but the investment was, especially made by large farms, in the present time 80% of machinery are older than 10 years.

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