

RADIO FREE EUROPE *Research*

COMMUNIST AREA

EE & USSR: Agriculture

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FARM POWER: PREREQUISITE TO PLENTY

The mechanization of agriculture has been one of the revolutionary contributions of science and technology to the progressive development of world agriculture. The utilization of tractors and other machinery has brought higher yields through intensive and timely cultivation of the soil.

Mechanization has also released manpower from the rural areas for industrial employment and replaced draft animals so that more land could be diverted to the production of livestock products. In this economic and social process labor productivity in agriculture has been significantly increased with a resultant rise in the living levels of the farming population. It is now held as an article of economic doctrine that the growth in labor productivity is the key to human progress.

The mechanization of agriculture has been more rapid in the developed countries with their abundant capital resources, declining farm labor forces, available cheap fuel supply, and large farm units. In the less developed countries, where these factors are not operative, mechanization has been restricted to a few plantation crops and the application of machine farming still lies in the future.

The Communist countries were influenced toward mechanical farming by the almost messianic faith Lenin had in the tractor as the panacea for Russian rural backwardness. In the chaos of the post-revolutionary period, and as a conciliatory gesture to the recalcitrant peasantry, Lenin proclaimed:

If we could only provide agriculture with a hundred thousand tractors -- you realize what fantasy that is at this time -- then the peasant would say "I am for communism."¹

1) Speech at the VII Party Congress, 23 March 1919.

From that time on, the tractor became the symbol of collectivization in all communist regimes, the prescribed new faith in the socialist reconstruction of agriculture. In their industrial planning, accordingly, the production of tractors was given some priority in the economic development of the Communist countries. Even Albania today is engaged in at least producing the spare parts needed for the array of tractor models imported from other Communist countries.

The number of tractors used in agriculture in any region of the world can serve as an indicator for its level of farm mechanization. On a global basis, tractor use rose by over 60 percent between 1954 and 1964. However, less than ten percent of the growth was in the developing regions, those most in need of greater food output. The developed regions have 15 times more tractors per unit of arable land than the developing countries.

The growth in farm mechanization during the past decade by world regions is shown in the table below:

Tractors Used in Agriculture²
(Garden tractors excluded)

Region	1954	1964	Increased 1954-1964
	Thousands	Thousands	Percent
Western Europe	1,590	4,160	162
Eastern Europe and USSR	865	2,139	147
North America	4,827	5,215	8
Oceania	250	385	54
Total, developed countries	7,533	11,916	58
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Latin America	218	488	124
Far East	30	88	193
Near East	55	111	102
Africa	143	230	61
Total, developing countries	446	917	106
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World total	7,979	12,833	61

2) Foreign Agriculture, USDA, 3 April 1967.

Western Europe had the most rapid increase in tractor power in the decade since 1954, and the sharpest reduction in the number of draft animals. West Germany and Austria led in the development of mechanization, the number of tractors per 1000 hectares of land in West Germany rose from 16 in 1950 to 120 in 1962, and in Austria, from 10 to 98. This rate of growth is a distinct achievement as the tractor industry was firmly established before the war and the progress reflects an extension of tractor power to the smaller family type farm on which European agriculture is based.

The tractor growth in the East European sector and in the Soviet Union was only a little less rapid than in Western Europe; however, the concentration of tractors per unit of arable land is much less. Czechoslovakia showed the fastest rise during the decade -- from 31,000 to 162,000 units. In the Soviet Union, they almost doubled between 1956 and 1965. The largest share of tractors went to the new grain lands opened up in Kazakhstan, Siberia and beyond the Volga.

The developments in North America foreshadow a state of equilibrium in tractor output for the Communist world, but only after several decades of concentrating maximum outputs of machinery into agriculture. The pattern in the U.S. and Canada has been that the number of power units increased moderately during the decade, but in the mid-fifties the field was already nearly saturated. Rapid mechanization of North America actually began in the late 1920's and was virtually completed after the war. Since then the purchase of tractors has been the result of acquiring new, heavier models and achieving more balance among the several types of power units. Most farms have several models of tractors types in use in the private agriculture of North America. Thus, in the decade 1955-64, in which other countries of the developed world recorded large increases in tractor use, the number of machines in North America rose by eight percent. Canada and the U.S. at present, have over 5.2 million tractors or 150 percent more than Eastern Europe and the USSR combined, and they have now reached the saturation point. Their tractor business today is based on replacing obsolescent models with new machines of technological superiority. The lesson for the Communist world is that it has taken thirty years for these two industrially developed countries of North America to fill the tractor demand of their private farmers operating in a free enterprise system. The Soviet Union produces an illuminating case study for a Communist country; it has been producing tractors for over thirty years, and, according to Khrushchev, succeeded in supplying [only] one-half the demand.

Clearly, the dynamics of satisfying the market for farm power are within reach of a highly developed industrial society, and the continuous production of a technologically up-to-date tractor model and hitch equipment is a full time task for a well-managed farm machinery industry in a developed economic system.

The density of tractors per unit of arable land is a general indicator in any country or region of its efficiency level in farm mechanization. In this study a quantitative yardstick is used as qualitative data are not available on such factors as speed, rubber tire mountings, and integrated machinery couplings. Because of the variable power ratings in tractor types, a conversion to 15 HP unit equivalent has been established.

As a guide to the comparison with Communist countries, a pilot study between a European and an American power model is first presented for study.

Farm Power in Two Western Countries

	<u>Number of Tractors</u>	<u>In 15 HP Unity</u>	<u>Hectares Arable Farm-land per 15 HP Tractor</u>
USA (a) (1965)	4,625,000	6,065,000	29
W. Germany (1964)	1,106,899	666,400	12.4

(a) excludes garden tractors.

If idle cropland and rotational pasture were excluded, the ratio would be 23:1.

Agricultural Statistics 1966, USDA, page 443.

FAO Production Yearbook, 1965, pp 3-4, 308.

With a wider diversity of land types and climatic zones, the USA with a ratio of 29 hectares of all types of arable land to each 15 HP tractor may well represent the optimally rational combination of tractive power for general farming purposes. West Germany, even with its smaller farms and land variations, is apparently near the over-mechanization level with its 12.4 hectares for each 15 HP equivalent tractor. But here again, such social-economic factors as the movement of population out of

agriculture, and the favorable terms of support offered by the government, no doubt warrant this degree of intensive mechanization.

The comparison with the East European Communist countries shapes up as follows:

Tractor Usage in Eastern Europe

(in order of intensity)

	Number Tractors in 15 HP unit	Hectares Arable Land per 15 HP Unit Tractor
CSSR	179,000	29
GDR	157,000	30
Hungary	92,000	59
Bulgaria	62,000	68
USSR	2,830,000	70
Rumania	133,000	74
Poland	146,000	105

Sources: USDA, Eastern European Agriculture, 1966, page 112.
FAO, 1965 Yearbook, pp 308, 3-4.

There is a big gap in the tractor resources between the countries at the bottom and those at the top of the table. There is also a striking parallel in the distribution of tractor power and the consumption of fertilizer. Here again, the two East European leaders in fertilizer use, the CSSR and the GDR, are also the leaders in farm mechanization. They should be, as machine production has historically been, a feature of their industries.

The table demonstrates that in general the larger the spatial distribution of farming operations the less the degree of mechanization, and conversely the smaller the

national farm area the greater the mechanization. Poland is the exception, but there the economic-political organization of agriculture prohibits private farmers from owning tractors.

The types of tractors to produce is a vital political issue in East Europe. As yet no garden type models for use in private plot farming are in serial production. The trend everywhere in East Europe is toward larger, faster, rubber-mounted traction of above 60 HP size. The above studies indicate that a power relationship of about 25 hectares cropland to one 15 HP tractor equivalent for general type farming seems a rational goal in farm mechanization. On this basis, the principal Communist regimes have a long road to push themselves forward before the power gap is closed. It may take a decade or two to supply the public sector with adequate power. Not until this gap is filled will it be possible to supply the private plots with an all-purpose garden tractor. That presupposes, of course, the regimes face up to the hard decision that the most rapid way to ensure an abundance of food is through a strengthening of the private plots. Such a decision is essentially a political one. Even a partial shift to small tractors would shorten the span of time needed to reach the long sought era of abundance in agriculture.

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