

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture: Internal aspects (1953–1986)

S. Merl

Stephan Merl, Dsc (History), Professor, Bielefeld University. Universitätsstr., 25, 33615 Bielefeld, Germany. E-mail: stephan.merl@uni-bielefeld.de

Abstract. The author focuses on internal aspects to answer the question why the complex mechanization of agriculture under Khrushchev and Brezhnev failed. The author argues that the command economy did not solve the basic task of ensuring animal production by large farms, because the high-quality equipment to reduce labor input and costs was not provided. Behind the facade of impressive reforms – from the virgin-land program and liquidation of the machine-tractor stations (MTS) to Brezhnev's 1966 promise to speed up mechanization and the Non-Black-Earth program of 1974 – nothing really changed. The basic deficiencies named in 1955 still existed in 1969 and after the establishment of the *Gosagroprom* in 1986: nearly all Soviet machinery was not reliable and was badly done. Thus, the increase in the production of such machinery under Brezhnev was only a waste of resources. Less than 10% of Soviet machines met the world standards. Instead of increasing labor productivity, this machinery caused the farms (and the state) enormous losses. Due to the gaps in mechanization (primarily in transportation and collecting feed) the majority of the agricultural workforce (70% in 1982) was still engaged in manual work. In the late 1960s, the Ministry of Agriculture made alarming reports on the state of the USSR's agriculture to the CC and CM and demanded – again in vain – urgent action and investment to modernize the agricultural machinery industry in order to ensure the world-standard inputs by 1975. The article considers challenges of developing animal husbandry, consequences of such campaigns as the virgin-land program, conversion of collective farms into state farms and liquidation of the MTS, successes and failures of the mass production of highly efficient machinery, proposed alternatives of organizing agricultural work and payment, and the state of agriculture in 1955, 1969 and 1986.

Key words: agricultural modernization, complex mechanization, agricultural machinery industry, efficiency of agrarian production, agricultural labor productivity, socialist competition, Khrushchev, Brezhnev, Khudenko.

DOI: 10.22394/2500-1809-2021-6-1-26-70

Introduction

The article provides archival evidence to the argument that the Soviet complex mechanization after 1953 was a failure (Merl, 2020a) focusing on its internal aspects rather than external factors (Merl, 2020b). To understand this failure, it is necessary to consider the key

challenges of agriculture after Stalin: the need to improve the quality of industrial inputs in agriculture and to develop animal production (underdeveloped and concentrated in private plots) at the large farms. Thus, the article questions the consequences of the political campaigns to ‘reform’ and ‘modernize’ agriculture started by Khrushchev and Brezhnev.

The article presents and discusses the data of the USSR Ministry of Agriculture on the state of the Soviet agriculture, often in comparison to Western countries, and on its shortcomings and malfunctions. Some of such reports were prepared on request ‘from above’. Many documents contain proposals on what should urgently be done to overcome the known shortcomings and complains about the governing bodies not executing the CC and CM orders. The Ministry was not allowed to blame the economic system and decision making for the defects. The striking finding is that the basic deficiencies named by the Ministry in 1955 and in the late 1960s were the same the *Gosagroprom* mentioned in 1986. Thus, the governing bodies either did not care or could not overcome the known bottlenecks, which caused severe damages to farms and in the end to the state: unreliable, badly done and often defective machinery, lack of high-quality machinery for producing and collecting feed, lack of transport at the farms, lack of materials for constructing barns, stores and stables, excessive fuel consumption by the outdated tractors, excessive need for repair and spare parts, and the extreme turnover of drivers and other specialists for the mechanized agriculture.

The aim to develop animal production at large farms required to significantly increase and mechanize feed production and to provide a lot of agricultural machinery and equipment not produced in the USSR. The first part of the article considers the corresponding issues to understand whether the state provided the necessary support to farms with the required investment. The second part analyzes the meaning of the virgin-land program for agriculture in the short and long run: reduction of the available machinery in the previously main agricultural regions in the mid-1950s, and the start of the permanent redistribution of agricultural machinery, transport and drivers between regions during harvest campaigns. Considering the corn-campaign failure as the necessary new machinery was not provided, the third part focuses on the production of efficient machinery and reasons why its mass production never started or was delayed. The fourth part examines reasons for the failure of the planned relocation of the agricultural research, training and ministries from the ‘asphalt’ to the state farms in the countryside. The fifth part considers the consequences of the fact that the farms had only defective, not reliable working machines and lacked special machinery and transport. This part mentions harvest losses and fatal accidents, and asks why the industry was not to compensate the farms for the losses caused by the defective machinery. The sixth part considers the reasons for blaming farms for the deficiencies of mechaniza-

S. Merl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

tion and for widening the ‘socialist competition’ awarding increasingly more agricultural workers with honorary titles and money prizes. The seventh part focuses on the alternatives of work organization and payment discussed in the 1960s to increase the efficiency of labor and machinery. The eighth part presents the alarming reports of the Ministry of Agriculture to the CC and the SM from 1969 to 1971, and the measures the Ministry required to improve the quality of industrial inputs in agriculture by 1975 up to the world standard. The concluding part presents the defects of the complex mechanization as stated by the *Go-sagroprom* in 1986.

The mid 1950s: animal husbandry at large farms and the lack of state support

Mechanization under Stalin focused on crop production and the use of harvest. Agricultural machinery factories produced mainly tractors, combine harvesters and machinery for field work. The most labor-intensive parts of farming, especially animal husbandry, root cropping and vegetable production were widely provided not by collective or state farms but rather by private plots (Merl, 2020a). Therefore, in 1953, the introduction of animal husbandry at large farms had to start from nothing and became a great challenge: most farms lacked the necessary buildings – stables and feed storage barns, machinery to produce feed and transport to collect it from fields, technology for the labor-intensive animal production – milking implements, technology for feeding, dung collection and watering. Many farms still waited to be electrified, which is a precondition for the large-scale animal production.

Let us consider first the machinery that in the 1950s the Ministry of Agriculture demanded to produce for animal husbandry and whether farms had the investments the governing bodies expected. The desired result – reduction of labor input and costs of animal production – depended primarily on the complex mechanization which did not get the necessary state support. I will discuss reasons for the failure in transforming weak collective farms into state farms, the consequences of the state purchasing prices being lower animal production costs, and the development of the collective farms’ financial situation after the elimination of the MTS.

The CC Plenum in September 1953 stated that there were no machinery systems for complex mechanization. At the beginning of 1955, Matskevich complained to the CM that only 5,600 of the ordered 20,000 silage harvesters were delivered to the farms. Trucks needed to collect the silage – a precondition for harvesting mechanization – were not provided¹. In the summer of 1955, he reported to Khrushchev (and also Saburov and Bulganin) that many Soviet agri-

1. RGAE. F. 7486. D. 7757. L. 75-78.

cultural machines had construction or production defects. The MTS lacked nearly all types of machinery: for feed – including corn production, transportation, lifting implements, for working between the lines, and efficient corn harvesters².

Keeping the collective and state farms' livestock in winter was a permanent challenge due to the lack and low quality of fodder. Every winter animals died due to poor feeding. Many collective farms did not harvest enough fodder, often the straw was not collected from the fields³. On January 25, 1955, the board discussed the lack of machinery to produce hay and to mechanize the labor-intensive animal production⁴. Mechanization of watering for the cattle suffered from the lack of pipes⁵.

On May 6, 1955, Matskevich reported to Khrushchev and Bulganin that the collective farms in their (ordered from above) planning to increase livestock production often forgot about fodder. There were no cultivators or corn harvesters to develop corn production, while the manual harvesting reduced yields significantly. The new combine harvester constructed by Emelyanov would harvest 80% of corn which could be made silage instantly. Matskevich requested optimistically that the Rostov factory would start its production in June 1955. As the farms were in great need for transport during the corn harvest, the *Gosplan* should be instructed to provide in the summer of 1955 50,000 trucks to the MTS per month, and the building industry was to construct storages for silage⁶. None of these requests was executed. On October 21, 1955, Matskevich complained that the *Goskonomkomissiya's* (GEK) plan for 1956 did not include the Ministry's requests. There were no grain, corn and silage combine harvesters. Providing only 16,000 corn harvesters would bring the level of the corn harvest mechanization only to 11%⁷. Instead of ordering to construct a special factory for feed-production machinery, the GEK instructed the aviation industry to produce silage harvesters⁸. On September 6, 1956, Volchenko reported that due to the lack of metal the industry reduced the production of deficit agricultural machines (such as corn silage harvesters)⁹.

The clearest consequences of the state's lack of support for introducing animal production at large farms were the severe problems the new state farms faced, when they were created from several small 'economically weak' collective farms. This conversion started in 1954

2. RGAE. F. 7486. D. 7709. L. 171-172.

3. RGAE. F. 7486. D. 6864. L. 53-56, 74-92; D. 7970. L. 203-216, 225-228; D. 8169. L. 20-21.

4. RGAE. F. 7486. D. 7377. L. 1-15.

5. RGAE. F. 7486. D. 8704. L. 110-111.

6. RGAE. F. 7486. D. 7708. L. 252-268.

7. RGAE. F. 7486. D. 7710. L. 100-110, 119-133.

8. RGAE. F. 7486. D. 8003. L. 68-75.

9. RGAE. F. 7486. D. 8003. L. 292-332.

and was based on the ideological expectation that state farms as the 'higher form of property' would radically change the economic production. However, on February 7, 1958, Volchenko reported to the *Gosplan* about the alarming results: while the average milk yield per cow at collective farms grew from 1956 to 1957 by 15% (1858 liters), it fell at state farms (from 2413 to 2358 liters) due to the conversion. The state farms failed to implement their plan of harvesting and delivering agricultural products to the state – they produced only 58% of the required hay and silage, and taking a lot of livestock and poultry from collective farms became a great challenge for the new state farms. The losses of livestock during winter due to poor feeding and costs of animal husbandry increased¹⁰.

In the late 1960s, most state farms made of weak collective farms were in a desperate situation. They urgently needed investments in the construction of such buildings as stables and barns, but the *Gosplan* refused to provide the necessary means. On August 12, 1968, Matskevich and Ezhevsky informed the CC that the planned reduction of the budget for construction would primarily affect the 5,600 state farms poorly equipped with the means of production. Most of them lacked housing and farm buildings. Their economic results did not provide the necessary investment¹¹. On September 6, 1968, the board reviewed the situation of these state farms again. To help them work efficiently, it demanded to provide them with energetic, mineral-fertilizer and material-technical implements in priority order. The *Gosplan* should be instructed to provide additional investments¹².

Chekmenev, the deputy Minister of Agriculture, informed the price commission of the CM Presidium that after the conversion of small collective farms into state farms the share of state farms working with losses increased in 1959. The state prices for meat, milk and wool did not cover production costs for the production was extremely labor-intensive and hardly mechanized. The yields were still low. The state farms' losses from the sales of meat and milk to the state increased from about 1 billion rubles in 1954 to more than 4 billion rubles in 1959¹³. An important reason for such losses was that state farms kept livestock as collective farms. Thus, they strongly suffered from the state-set purchase prices for animal products, which caused losses as the prices did not cover production costs. The slightly higher prices paid to collective farms did not cover their production costs either. On November 29, 1960, Matskevich demanded from the CM to increase the producer prices for animal products¹⁴. As animal production was extremely labor intensive, the only way to cut costs was

10. RGAE. F. 7486. D. 8314. L. 125-168.

11. RGAE. F. 7486. D. 9127. L. 107-115.

12. RGAE. F. 7486. D. 9116. L. 300-306.

13. RGAE. F. 7486. D. 8539. L. 181a-209.

14. RGAE. F. 7486. D. 8540. L. 123-150.

to use efficient machinery for collecting fodder and mechanizing animal production. Some of the needed machines were not produced by the Soviet industry.

Moreover, financially collective farms suffered from arbitrary actions of the local authorities. They wanted 'illegal' deductions from the collective farms' money, as was the situation under Stalin, to finance local needs without the vote of the collective farm members' general assembly. This caused delays and debts in work payments of the collective farm members. On April 17, 1967, Matskevich informed the CC that collective farms had to pay the postmen, the construction of the *rayon* hospitals, sanatoriums, schools and local clubs, in the Odessa Region – an inter-farm cement factory, and in the Khereson Region – a medical institute¹⁵. On August 8, 1969, the CC forbade such 'illegal deductions' from the collective and state farms' funds. On January 18, 1971, Matskevich reported (on the request) to the CC on fulfilling this order, but in some cases such 'deductions' continued. The *Gosbank* did not control the use of the collective farms' finances, which opened the way for illegal deductions¹⁶.

The financial mess with the collective farms under Khrushchev was aggravated by the state's strange fear that 'collective farms would become rich'. Collective farms under Khrushchev were to ensure all their investments by 'profits' from the sales of their production to the state. While the state purchase prices for crop production were quite sufficient after 1953, prices for animal products did not cover the production costs.

When expecting a good harvest in 1958, the governing bodies worried that collective farms would get too high profits due to the 1953-1955 increased producer prices. On August 25-26, 1958, the Ministry's board discussed the lowering of the purchase prices and ordered the republic ministries of agriculture to lower prices for grain, sun flowers, sugar beets and corn in the expected regional harvest, taking into account (sic!) the developing mechanization, improved farm machinery and increased labor productivity¹⁷.

When expecting a good harvest in 1960, the governing bodies again forcibly lowered the agricultural purchase prices. Some regions reacted reluctantly, but nobody dared to oppose Khrushchev openly. On May 21, 1960, Tasenev (the Kazakh CM) informed the USSR CM that although the money income of collective farms in 1959 exceeded that of the previous year, the payment to the farms' members decreased on the average by 17%. The indebtedness of collective farms was also determined by the purchase of the MTS machinery: they owed 0.8 billion rubles to their members for work¹⁸. Only Ukraine protested

S. Merl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

15. RGAE. F. 7486. D. 9046. L. 55-59.

16. RGAE. F. 7486. D. 9274. L. 10-12; D. 9356. L. 18-27.

17. RGAE. F. 7486. D. 8297. L. 107-116.

18. RGAE. F. 7486. D. 8539. L. 131-131a.

and demanded to increase the state prices for grain by 10%: collective farms showed an increase in their indebtedness – only to their members they owed for work 6.8 billion rubles¹⁹.

The governing bodies were much more concerned about the artificial losses of dairy plants due to the state fixed prices than about the losses of collective and state dairy farms²⁰. In 1958, the enforced purchase of the partly defective MTS machinery at the prices of the new one dramatically worsened the financial situation of collective farms and their ability to pay their members for work and to purchase new equipment to raise the work efficiency. The Khrushchev's order demanded to provide money for the MTS machinery as soon as possible, which reflected his need to raise money for his space program and his belief that collective farms got 'high' incomes from selling the 1958 harvest²¹.

On September 23, 1960, Chekmenev (the *Gosplan*) informed the CC Presidium Commission for prices that the liquidation of the MTS under the pressure to purchase their agricultural machinery, changes in the procurement system, and the new state purchase prices for agricultural products significantly worsened the collective farms' economic and financial situation. The producer prices for crop production in 1959 on the average covered 159% of the collective farms' costs, but the prices for animal products – only 80% (beef – 65%, pork – 70%, poultry – 66%, milk – 84%). Regional differences were drastic: the average prices for animal products in Ukraine covered 70% of the production costs, in Middle Asia and Estonia – from 125% to 141%. Costs of many collective farms were very high due to poor mechanization. Therefore, even production of potatoes and vegetables brought many collective farms losses. The permanent pressure on collective farms to sell more animal products to the state was increasing their losses. Due to poor mechanization, the labor inputs required for animal production was higher than at state farms. Collective farms were forced to sell animal products below their costs; thus, they lacked money to buy machinery to increase their production efficiency. The dramatic financial situation of collective farms, which deprived them of necessary investments, becomes evident from the state standard that 45% profitability was needed for accumulation of the state prescribed funds²². Thus, the state paid for the collective farms' animal products hardly half of the price necessary for reproduction!

Chekmenev provided detailed information on the collective farms' financial situation in the late 1950s. In 1959, their incomes increased only by 5.4%, while expenditures for capital investment jumped from 23.9 billion rubles in 1958 to 48.5 billion rubles in 1959 due to the en-

19. RGAE. F. 7486. D. 8539. L. 262-266, 270.

20. RGAE. F. 7486. D. 8185. L. 50-62.

21. RGAE. F. 7486. D. 8297. L. 107-116.

22. RGAE. F. 7486. D. 8540. L. 1-32.

forced purchase of the MTS machinery. These used machines became an additional burden for collective farms which had to cover the extremely high costs for maintaining this equipment. Many collective farms were forced to take long-term state credits, and in the early 1960, more than 10 billion rubles of credits were already overspent. The credit indebtedness of collective farms increased from 32.4 to 50.5 billion rubles in 1959. The average payment per a labor-day decreased in 1959. Under the uniform purchase prices for agricultural products introduced in 1958, the state paid on the average 10% to 15% less to farms, which determined their losses of 4 billion rubles in 1958 and of 9.1 billion rubles in 1959. In 1959, the award of 15% to 25% for selling milk to the state was eliminated. Farms had to spend more money on industrial inputs: tractors, trucks, cars and agricultural machinery's spare parts. Thus, the state increased its income by 4.1 billion rubles in 1959, and with the higher income tax got another 2 billion rubles from collective farms²³. The state's savings and additional incomes meant losses for collective farms – 4.2 billion rubles in 1958, 9.6 billion in 1959 and 10.5 billion in 1960. The total losses of collective farms in three years were 24.3 billion rubles – due to the increase in prices on spare parts – 4.1 billion rubles in 1959 and 1960, increase in the income tax – 2 billion rubles in 1959 and 1960, and the reduced producer prices – 4.2 billion rubles in 1958, 3.5 billion in 1959, and 4.4 billion in 1960²⁴.

Collective farms' profitability varied by republic. Farms specializing in sun flowers, cotton, flax and, in some regions, grain were highly profitable, while animal husbandry and some other crops were unprofitable. On the average, collective farms reached profitability of only 9% (instead of 45% set as a standard), which meant that the average collective farm in the early 1960s could not accumulate resources. Chekmenev asked the CM to instruct the *Gospplan* and the Ministry of Finances to pay special attention to the significant differences in profitability of plant and animal production. Collective farms urgently needed incentives to produce more animal products. Due to the desperate financial situation of many collective farms, the Ministry of Agriculture demanded to reduce the input prices for tractors, cars/trucks and agricultural machines' spare parts, because the set prices endangered the necessary repair work and prevented the farms' accumulation. Collective farms' incomes from animal products were to be exempt from the income tax²⁵.

In their report to Khrushchev from December 24, 1960, 'On urgent measures to increase the USSR agricultural production', Matkevich and others hinted at the desperate financial situation of collective farms. They demanded to increase the state purchase prices

23. RGAE. F. 7486. D. 8540. L. 1-32.

24. RGAE. F. 7486. D. 8541. L. 214-307.

25. RGAE. F. 7486. D. 8540. L. 1-32.

for agricultural products and to reduce the prices of industrial inputs for farms. Collective farms were to be reimbursed for transport costs to deliver their products to the distant state procurement points. Matskevich and others required to increase the state capital investments in agriculture significantly compared to the draft plan, and a third of investments was to be used for constructions²⁶. In 1962, the Economic Commission of the Nationalities Council demanded to strengthen collective and state farms by lowering the prices for tractors, machinery and spare parts, and by reducing the income tax for collective farms selling animal products to the state²⁷.

In 1968, the ‘price scissors’ – artificially low prices for animal products and comparably high prices for industrial inputs – attracted attention again. On July 4, 1969, Matskevich informed the CC that since 1962 the costs of animal products had increased significantly instead of falling (due to the failure of mechanization). The average profitability of animal production reached only 6% at collective and 4% at state farms. Therefore, the Ministry proposed to reorient the system for stimulating crop production to animal products and to introduce 25% surcharges for sales above the plan. The surcharge for milk and regionally for meat was to be increased²⁸.

Thus, what the state demanded for developing the large-scale animal husbandry was a vicious circle. To reduce production costs, farms had to invest in the highly productive technology; however, farms lacked the means to afford investment due to the state prices on animal products; and even if farms would have earned the necessary money, they would not have bought the necessary effective equipment for the Soviet industry did not start to produce such. The *Gosplan* provided neither the necessary investment to construct new agricultural machinery factories for the large-scale animal husbandry nor the necessary building materials for farms. The governing bodies did not admit that to ensure animal production at large farms, they needed state support. The distrust to peasants and collective farms spread under Stalin persisted: the governing bodies feared that collective farms would become ‘rich’ and were more concerned with hindering ‘individual profits’ than with raising the farms efficiency.

Virgin-land campaign: the start of the permanent emergency mobilization

The transfer of machinery and drivers from the central regions to the virgin lands was first declared to be a temporary emergency measure. However, it became the most stable element of the USSR ‘social-

26. RGAE. F. 7486. D. 8541. L. 214-307.

27. RGAE. F. 7486. D. 8704. L. 20-34.

28. RGAE. F. 7486. D. 9209. L. 130-187.

ist' agrarian policy after Stalin: machinery, especially combines, were moved to the east (sometimes to the south) within the annual 'harvest help' campaigns. Trucks were moved between regions and ministries, and under Brezhnev in most regions – from cities to the countryside. Drivers (including soldiers) were moved between regions. Each September/October, students, mechanics and drivers from other economic branches were sent for 'harvest help' in their region.

On December 28, 1953, the Ministry's board criticized Fedoseev for he delayed the sending of tractors from the 1953 fund to the virgin lands. He was made personally responsible for that all produced caterpillar tractors had been sent to Kazakhstan and Siberia since January 1, 1954. All other available material-technical supply had to be distributed in such a way that the virgin lands' needs were 'fully' satisfied²⁹. Thus, the start of the virgin land campaign meant that other agricultural regions, especially the main black-earth areas, were deprived of new agricultural technology, although there was a shortage of tractors, combines and other machinery, and many machines were broken or outdated. In many regions, the number of tractors ready for work declined³⁰.

Ukraine particularly suffered from the primary delivery of new machinery to the virgin lands. On November 10, 1955, the Ukrainian CM informed the USSR CM that the required increase of sown area for industrial crops could not be achieved: MTSs and state farms lacked the necessary machinery. In 1954 and 1955, they got only 1,229 new tractors, while 1,440 existing tractors were broken. Many MTS did not have enough tractors to harvest the grain. No other agricultural work could be done during the harvest. The situation with combine harvesters in 1955 was catastrophic, but Ukraine still had to send combines as 'harvest help' to the virgin lands. With the existing combines the 1955 harvest could not be collected in time. Many existing combines were produced from 1932 to 1935 and were totally outdated. The GEK did not take into account that each year about a half of the grain was harvested from the ground. In 1956, to harvest the grain as was ordered – in 10 days, 50,000 additional combines and trucks were needed³¹.

On November 29, 1955, Kuchumov, the deputy Minister of Agriculture, informed Saburov (the deputy CM) that in Ukraine and the North Caucasus the MTS suffered from a lack of combine harvesters. In 1956, the existing combines could harvest only 35% of the grain. The industry fell far behind the plan for producing combines. Therefore, Kuchumov asked the CM to provide Ukraine and the North Caucasus with 10,000 combines from the Ministry's fund for state farms. Benediktov agreed to waive of the allocation of combines in the first

29. RGAE. F. 7486. D. 6864. L. 225-227.

30. RGAE. F. 7486. D. 7710. L. 217-292; D. 7707. L. 298-229.

31. RGAE. F. 7486. D. 8001. L. 10-21.

half of 1956³². On May 5, 1956, the Uzbek CM informed Matskevich of the lack of combine harvesters. The MTS could ensure harvesting of only 600,000 hectares, while the other 230,000 hectares of collective farms would be harvested by hand. In 1955, the harvesting of 285,000 hectares by hand delayed the harvest until November and caused huge losses³³.

The Ukrainian situation with combine harvesters was still extremely tense in 1959. Kalchenko (the chairman of the Ukraine CM) addressed the USSR CM to inform that there were only 40,000 pull-type combine harvesters for the grain harvest, and they could be used only with DT-54 tractors. Collective and state farms asked for 12,600 tractors, but the *Gosplan* provided only 4,000, i.e., in South Ukraine, about 5,000 combine harvesters would not have traction power. In July 1958, Ukraine had to send 2,500 pull-type combine harvesters to Kazakhstan; however, instead of providing the requested 5,370 grain combine harvesters, the *Gosplan* provided only 390. For the 1959 harvest, there was an urgent need for 2,500 pull-type combine harvesters; for collecting silage – of 168,000 3-ton trucks but only 82,000 existed. In total, in 1959, agriculture needed at least 666,000 trucks – 497,000 of the *Gigant* type, while the *Gosplan* provided only 40% of the needed number³⁴.

The regional ‘lending’ of machinery and drivers started in the mid-1950s. On August 6, 1956, Matskevich ordered (as the deputy chairman of the USSR CM) that right after harvesting in the south, all harvest machinery was to be transferred to Kazakhstan and Siberia, including swaths reapers and pick-up balers. Qualified accountants were to be sent to the virgin lands too³⁵. 28,000 combine harvesters were transferred from the south to the virgin lands. 325,000 trucks (211,000 in the RSFSR, 77,300 in Kazakhstan, 24,600 in Ukraine) were sent to harvest from other branches of the economy³⁶. On March 8, 1957, Gureev, the deputy chairman of the Ukraine CM, protested against the order to send 8,400 drivers trained at the Ukrainian agricultural schools to Kazakhstan. Even if all these drivers would have stayed in Ukraine, their number would still fell far behind the needed³⁷.

It became a permanent problem to get the transport and machinery lent to other regions back, and an even greater problem was to get them back in a working condition. On January 4, 1956, Benediktov, the Minister of State Farms, complained to the CM, that the Ministry of Agriculture did not return 2,269 of 9,000 combine harvesters

32. RGAE. F. 7486. D. 7710. L. 173-182.

33. RGAE. F. 7486. D. 8002. L. 237-240.

34. RGAE. F. 7486. D. 8435. L. 277-310.

35. RGAE. F. 7486. D. 8003. L. 155-189.

36. RGAE. F. 7486. D. 8226. L. 103-111.

37. RGAE. F. 7486. D. 8185. L. 44-46.

provided by his Ministry to the southern agricultural regions on the order of the CC and CM from December 25, 1954³⁸.

To ensure the 1958 spring sowing, the Kazakh CC and CM requested 50,000 tractor drivers from other republics. The RSFSR and Ukraine again protested in vain against the CM's order to send drivers to Kazakhstan³⁹. It became quite usual to request additional machinery and drivers from other regions to harvest. Thus, in December 1959, Kunaev, the chairman of the Kazakh CM, asked Kosygin for additional combine harvesters and tractors together with additional drivers to speed up the 1960 grain harvest⁴⁰.

The need to move tractors, combine harvesters and drivers to the virgin lands did not disappear under Brezhnev. Agricultural regions never had enough agricultural machinery in working condition. On May 14, 1966, the Ministry's board decided to establish an operative team responsible for transferring trucks and combine harvesters during the harvest to the places where they were needed the most⁴¹. For instance, on June 2, 1966, the Belgorod western region asked Polyan-sky for 'harvest help'. On June 8, 1966, Matskevich ordered the Kazakh and RSFSR ministers of agriculture to send combine harvesters to Belgorod⁴².

On June 14, 1966, Matskevich and Ezhevsky presented on the request the draft decree 'Measures to secure the harvest and procurement of agricultural products in 1966' to the CC. Due to that year weather conditions, the time for harvesting was extremely short. However, the repair of tractors and machines was delayed as there were no needed spare parts. Grain combine harvesters should be delivered earlier than planned to the RSFSR and Ukraine. The Ministry of Defense was to provide 60,000 and the Ministry of Construction 20,000 trucks; 151,700 tires should be provided additionally⁴³. On July 8, 1966, Matskevich and Ezhevsky proposed to the CC and CM a plan to provide agriculture with the necessary transport. In the east, they expected a good but late harvest, so the army was to send trucks to Kazakhstan, Ukraine and the south. Spare parts (tires) and fuel were to be supplied separately⁴⁴. On July 9, 1966, the RSFSR CM informed the USSR CM that 50,000 army trucks with drivers and officers were additionally needed in the Urals, Western and Eastern Siberia⁴⁵.

On September 19, 1968, Matskevich informed the CC that due to the problems with the 1968 harvest 32,500 trucks of the Ministry

S. Mertl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

38. RGAE. F. 7486. D. 8001. L. 3-4.

39. RGAE. F. 7486. D. 8188. L. 167-169; D. 8314. L. 9-13.

40. RGAE. F. 7486. D. 8438. L. 190-194.

41. RGAE. F. 7486. D. 8947. L. 136-139.

42. RGAE. F. 7486. D. 9023. L. 1-3.

43. RGAE. F. 7486. D. 9023. L. 11-18.

44. RGAE. F. 7486. D. 9023. L. 33-41.

45. RGAE. F. 7486. D. 9023. L. 109-118.

of Defense were sent from Kazakhstan to other regions, especially Ukraine⁴⁶. On October 8, 1969, the CC and CM ordered to send 17,500 trucks from other branches of the economy to Ukraine. Even the local machinery taken into account, Ukraine still lacked the necessary 54,000-64,000 trucks⁴⁷.

In the draft decree to the CM 'On securing harvesting and procurement in 1970' from April 24, 1970, Matskevich, Ezhevsky and others again demanded to provide the machinery ahead of time, to provide additional funds and transportation for agricultural products, and to give credits to farms to pay for fuel and repair. If necessary, self-propelled combine harvesters would be sent from the south to the east⁴⁸.

On October 6, 1971, Matskevich informed the CC that the situation with trucks at collective and state farms was getting worse, because each year from 25% to 30% trucks were taken by the army to transport the harvest. The army returned these trucks without repair, and 22,000 of 30,000 trucks in 1970 were not returned. The loss of these new trucks became a special problem for farms – they were replaced by old trucks, which caused additional harvest losses. Matskevich asked the CC to order the Ministry of Defense to return the farms' trucks or to provide the same number of the army new trucks⁴⁹. As the situation was not resolved, on October 18, 1971, Matskevich addressed Brezhnev personally: the trucks not returned by the army caused extreme problems with transporting the harvested sugar beets – about 12.5 million tons of sugar beets could spoil on the fields. The CC and CM ordered to take 9,000 new trucks sent by the Kazakh army to Ukraine to harvest sugar beets until December 1. However, Grechko, the Minister of Defense, ordered to replace all 30,000 new trucks by the old ones. More than a half of these old trucks had technical defects and could not be used. Matskevich asked Brezhnev to instruct Grechko to send all army trucks to agriculture until December 1⁵⁰. On June 29, 1971, Matskevich, Ezhevsky and Florentiev, the RSFSR Minister of Agriculture, sent the CC on the request a draft decree regulating the increased supply of grain combine harvesters, trucks and drivers to the Urals, Siberia and the Kazakh virgin land – additional 4,000 combine harvesters were to be sent from the south to the Urals and Siberia. To overcome the lack of tractor and combine drivers at the Kazakh virgin land, 30,000 (instead of 5,000 set by the *Gosplan*) drivers were to be sent to Kazakhstan from other regions⁵¹.

46. RGAE. F. 7486. D. 9127. L. 158-161.

47. RGAE. F. 7486. D. 9253. L. 352-369.

48. RGAE. F. 7486. D. 9332. L. 233-283.

49. RGAE. F. 7486. D. 9357. L. 142-143.

50. RGAE. F. 7486. D. 9357. L. 161-165.

51. RGAE. F. 7486. D. 9357. L. 60-75.

While in the short political run it strengthened the Khrushchev's rule, the virgin land campaign became a nail in the coffin of the Soviet agriculture: this campaign started the permanent redistribution of scarce machinery, drivers and workforce between regions during the harvest – it was economically harmful for the central production areas which urgently needed the agricultural machinery that was sent to the virgin land. Thus, the virgin land campaign significantly reduced harvests in Ukraine in the mid-1950s. In the long run, such emergency measures as the redistribution of scarce machinery (combines and trucks), drivers and mechanics during the harvest became a permanent means of the state interference in the farms' economy and a factor of uncertainty (with the available resources) for the farms' leaders. *Obezlicka* spread as nobody really felt responsible for the machinery, and costs were never calculated.

Improved technology and the failure to start its mass production

The machinery produced until 1953 was outdated in the international perspective. Many agricultural machines were defective and poorly done. Most equipment needed for animal production and harvesting special crops was not produced in the USSR. There was a great need for the new, more effective and high-quality machinery, and in its mass production.

The Benediktov's draft decree (on the request of the CM) from December 28, 1954, 'On the production of new tractors, agricultural machines and implements in 1955', demanded the production of 53 new types of such. Instead of assessing the need for the requested machinery, the *Gosplan* criticized the draft in its comment to Malyshev (the deputy chairman of the CM) for contradicting the CM's decree from June 11, 1948, because the draft was developed without consultations with the production ministries and with the technical council on mechanization and electrification. The ministries did not agree with the draft. The *Gosplan* asked the CM to order the Ministry of Agriculture to make a new draft based on the agreement with the industry⁵². Thus, not the needs of agriculture guided the Soviet industry, but what the industry wanted or proposed to supply and what the *Gosplan* was ready to finance. Nobody really cared about the needs of agriculture and complaints about the poor quality and defects of the machinery.

The testing of new and improved tractors and agricultural machinery began before 1955. On January 6, 1955, Benediktov, the Minister of Agriculture, together with Akonov, the Minister of Car, Tractor and Agricultural Machinery Construction reported on the request to the CM that in October 1954 the sample copies of the potato harvester

52. RGAE. F. 7486. D. 7757. L. 70-72.

constructed by the All-Union Research Institute of Agricultural Machinery were tested. Many construction defects were found: the machine collected only 73% to 87% of potatoes and often broke down⁵³. The second testing of the flax harvester LK-7M was not successful: the required improvements were not made, and the machine was poorly produced⁵⁴. On January 8, 1955, Benediktov reported that the testing of the hay baler revealed severe construction defects which led to the loss of 10% to 15% of hay⁵⁵.

On November 28-29, 1956, the Ministry's board discussed with the Ministry of State Farms' board the testing of Soviet and imported machines in order to introduce a new agricultural technology. The 20th Party Congress demanded to increase the production of tractors by 1960 by 2.7 times. The boards criticized the slow progress of their production: from 416 new machines presented in 1956 only 29 passed the testing successfully and could be put into mass production. Often it took 10 and more years to design new machines, but when mass production started, the construction offices no longer cared about making further improvements. The boards required the production of the modernized tractors. The DT-24 still had serious defects and needed essential construction changes. The boards demanded to launch in 1957 the production of tractors with electric ignition. They made a list of the machinery needed the most: effective combine harvesters, harvesting machinery for corn, sugar beets, potatoes, cotton and hay⁵⁶.

When planning the needed number of agricultural machinery in the mid-1950, the boards faced the question whether the USSR should focus on the Western standards. On July 17, 1956, Chekmenev (the *Gosplan*) addressed Volchenko (the deputy Minister of Agriculture) on the issue of the Soviet agricultural technological standards. The 20th Party Congress demanded to produce a great number of tractors, combine harvesters and agricultural machinery: in 1960, in the MTS one (15hp) tractor was to work on 85 hectares, at state farms – on 68 hectares. Concerning combine harvesters, the recommendations of the British ministry were used. As the USSR fields were larger, foreign standards were not accepted for calculating the need for agricultural machinery for the Five-Year-Plan⁵⁷.

On October 20, 1956, Volchenko informed the CM Presidium that the GEK's 'draft plan for 1957' did not follow the production goals set by the September CC Plenum in 1953 and did not meet the agriculture's urgent demands. Thus, the production of only 44% of the requested tractors would not speed up field works as was planned. De-

53. RGAE. F. 7486. D. 7757. L. 12-13.

54. RGAE. F. 7486. D. 7757. L. 36-41.

55. RGAE. F. 7486. D. 7757. L. 18-20.

56. RGAE. F. 7486. D. 7970. L. 263-302.

57. RGAE. F. 7486. D. 8003. L. 14-17.

spite the set standard of 60 to 80 hectares, the work load per tractor in Ukraine was 125 hectares. The production of the urgently needed tractors with high engine power was reduced from the requested 20,500 to only 450. The production of other agricultural machinery was also drastically reduced. Moreover, the orders of the CC Plenum on providing the MTSs with repair stations were not executed⁵⁸.

A serious step to develop new machinery was made in 1957, before the Khrushchev's 'decentralization' and the decision to liquidate the MTS hindered further actions. On October 8, 1957, when discussing the 1958 plan and budget, Volchenko (the deputy Ministry of Agriculture) named the following urgent tasks for the farm mechanization: production of agricultural machinery, construction of buildings and repair stations, and training drivers. 85 machines to be designed and manufactured in 1958 were listed, including a small manual caterpillar tractor for horticulture and wine growing with 16-20 hp, and a new tractor with 30 hp. The wheeled tractor MZZ-7 was to be developed on the basis of the Belarus model. A tractor with a uniform hydraulic system was to replace the DT-54, and a two self-propelled chassis with 45 and 70 hp motors was to be constructed for harvesting machinery and other agricultural machines (mass production was to start in 1960). The list also included machinery for soil cultivation and spreading fertilizers, a pull-type grain combine harvester (mass production of the self-propelled grain combine harvester Type SK-3 with 70hp was to start in 1960), harvesting machinery for corn and oil seeds, industrial crops, potatoes and vegetables, machinery for horticulture, wine growing, tee, timber and subtropical crops, machinery for pest control and fodder harvesting, a new hay baler and a silage harvester for the mechanization of animal production (mass production was to start in 1959, of the silage harvester with 70 hp – in 1960)⁵⁹.

Hardly any of the machines requested by Volchenko were provided or put into mass production in the following decade. However, attempts to achieve the set goals started in 1957. On May 27, 1957, at the consultations with the *Gostekhnik* the requested improvements were discussed: experiments with new wheeled tractors with better off-road performance, self-propelled harvesters, and so on. The limited availability of tires was mentioned, but the Yaroslavl Tire Company promised to produce tractor tires⁶⁰. The stronger control of the set deadlines was required: the industry provided samples for testing with delays: from 88 tractors scheduled to be tested in 1957 only 6 were provided in time, and 32 never provided⁶¹.

On January 19, 1959, Kuchumov, the deputy Minister of Agriculture, informed Ezhevsky (the *Gosplan*) about the agriculture's need

58. RGAE. F. 7486. D. 8003. L. 228-249.

59. RGAE. F. 7486. D. 8188. L. 13-18.

60. RGAE. F. 7486. D. 8221. L. 11-16.

61. RGAE. F. 7486. D. 8221. L. 101-108.

for 2.1325 million tractors (73% – wheeled tractors) in the 7-Year-Plan (1959-1965). The *Gosplan* provided significantly less – only 1.2506 million tractors. Kuchumov accepted the reduced number provided that those tractors would ensure a decisive increase in the agriculture's efficiency. Therefore, he asked to change the types of the provided tractors: a share of them was to have 4 driving wheels. The types proposed by the *Gosplan* did not satisfy the needs of the grain, cotton and sugar-beet regions. The number of small tractors (DT 20, 28, 30) was to be significantly reduced – by 237,000, and instead the DT 40 – 40,000 – was to be provided, the DT 54 and DT 70 – a total of 432,700 (90,000 more), and 426,300 of the *Belarus* (68,500 additional) were to be produced⁶².

On October 23, 1961, Olshansky, the Minister of Agriculture, complained that the *Gosplan's* draft plan for 1962 increased the supply of agricultural machines as compared to 1961, but would not ensure the set scale of mechanization of sowing and harvesting grain crops and straw. Without the mechanization of these works, the autumn plowing would be also delayed. Straw harvesting was mechanized only to 29%; the harvesting of corn, cotton, sugar beet and potatoes still lacked combine harvesters, which also hindered the introduction of progressive production methods. The draft did not ensure the mechanization of labor-intensive works in animal husbandry⁶³.

In September 1968, Samarin, the chairman of VSNTO, sent a list of models ready for mass production to the CM. He criticized the still not regulated cessation of the outdated machinery production and the start of mass production of new models. The mass production of 55 new machines still did not start, while 17 other new machines were ready to replace the outdated ones. From 545 produced agricultural machines at least 140 had serious defects. Often the repair was complicated: sometimes it took up to 7 hours only to prepare the repair. Construction defects caused fatal accidents. He demanded the standardization of agricultural machines⁶⁴.

On January 19, 1968, Matskevich und Ezhevsky commented on the *Gosplan's* proposal to speed up the supply of agricultural machinery and spare parts. The main controversy was with investments in animal husbandry which lacked milking equipment, transportation for dung, distribution of fodder, battery cages for poultry. The *Gosplan's* proposed cut of investment in the FYP until 1975 would mean the impossibility of the planned reduction of labor input in animal husbandry. At that time, the labor input per a kilo weight increase in cattle fattening was more than 10 times higher than in the US. The *Gosplan's* plan of plant mechanization did not correspond to the agriculture's minimal needs: it would allow to mechanize only 28% of

62. RGAE. F. 7486. D. 8434. L. 16-22.

63. RGAE. F. 7486. D. 8626. L. 193-204.

64. RGAE. F. 7486. D. 9242. L. 177-198.

production. Matskevich und Ezhevsky made a list of new machinery factories to be constructed to provide the high-quality equipment needed to reduce the labor input (such as wide harvesting machines which the *Gosplan* did not even intend to design).

On March 22, 1968, Matskevich and Ezhevsky with the CM protested against the *Gosplan's* draft decree 'On measures to improve the technical level of tractors and agricultural machinery' for it did not execute the CM's order to reduce the labor input by the use of the highly efficient machinery. Instead of starting the mass production of the new, successfully tested agricultural machines, the *Gosplan* insisted on producing the outdated machinery, while there were highly productive tested machines (for instance, in 1965, the potato combine harvester). Moreover, the *Gosplan* stopped the production of 150 standard agricultural machines without replacements⁶⁵.

On March 3, 1969, the Ministry of Car, Tractor and Agricultural Machinery Production reported problems with speeding up the tractor production: in 1968, up to 20% less tractors were produced due to the problems with getting motors from the motor factories and to the lack of workforce. Efforts were made to improve the quality and reliability of tractors and to improve their cabin, but the factories suffered from the insufficient supply and poor quality of inputs⁶⁶.

More than a decade after the first request, in the late 1960s, new, more efficient combine harvesters (*Niva* and *Kolos*) were presented, and their mass production was to start in the FYP 1971-1975. Already on December 13, 1968, Matskevich with Lebedev (the *Gosplan*) protested against the reduction of the number of these combines to be produced by 1975⁶⁷, but later there was a further reduction. The production of the combines *Niva* and *Kolos* was to start at the Taganrog factory in 1971 – 83,000 *Nivas* and 7,000 *Koloses* were to be produced by 1973. In many respects, they were closer to the Western standards, however, of those of the 1950s⁶⁸. On March 19, 1970, Matskevich informed the CM that even the best Soviet grain combines fell far behind foreign models (including the GDR E-512): their energy supply, productivity and output capacity were too low, the amount of metal used for production – too high, and the operating comfort for drivers – minimal. Even *Niva* and *Kolos* did not meet the world standards as they did not cope with higher yields per hectare. They needed too much time for technical maintenance, lacked speedometers, means to assess the energy load and grain losses when threshing, and their energy supply was too low: instead 120 hp for *Niva* and 17chp for *Kolos* would be necessary⁶⁹.

65. RGAE. F. 7486. D. 9165. L. 142-143.

66. RGAE. F. 7486. D. 9241. L. 96-113.

67. RGAE. F. 7486. D. 9167. L. 233-255.

68. RGAE. F. 7486. D. 9314. L. 76-85.

69. RGAE. F. 7486. D. 9281. L. 55-66; D. 9314. L. 76-85.

In the discussions on the quality of agricultural machinery, the question was whether caterpillar or wheeled tractors were preferable for the Soviet agriculture. Wheeled tractors were considered universal – for cutting hay, cultivating root crops, and especially transportation; they were less expensive for the farms as they needed repair less often and the prices for their spare parts were lower. Due to the high repair need, working with the Soviet tractor was more expensive than buying it, while in the West repair costs constituted only 20% of the purchase price in 7 years of work. For the Soviet agriculture wheeled tractors were also preferable, but the *Gosplan* and tractor industry chose caterpillar tractors. Unlike western countries, the purchase price for wheeled tractors were twice higher than for caterpillar tractors, although in the West they were 1.5 times less expensive. This difference was not economically determined, but was partly explained by the price for tires: in the USSR, tires made 20% to 28% of the tractor's price, while in the West – only 2% to 7%. In the USSR, until 1955, in general wheeled tractors were not used for transportation due to their speed of just 5-9 km per hour (in 1970, – 9-15). Caterpillar tractors contributed to the high turnover of drivers: as they could not be used for transportation, drivers were often employed only for the field season⁷⁰.

The designing of new and highly productive machinery slowly developed from 1955 to 1958, but was stopped by the Khrushchev's administrative reorganization which transferred the agricultural machinery production to local *SovNarKoms* and liquidated the MTS, thus, reducing the farms abilities to invest. In the 1960s, the designing of highly efficient machinery continued, but the governing bodies showed little interest in providing the necessary investment for its mass production.

The failure of Khrushchev's 'relocation from the asphalt to the countryside'

In 1961, Khrushchev started the relocation of agricultural training facilities and research institutions including the Academy of Agricultural Sciences (VASKhNIL) and ministries of agriculture 'from the asphalt to the countryside'. The decree required the transfer of millions of people – staff and students – to the countryside with no facilities for accommodation, training, research, and everyday services. To implement the relocation, huge finances and building materials were needed, but the governing bodies did not provide them in 1961-1964, although there were successful examples of establishing new research centers in the countryside (*Akademgorodok* near Novosibirsk and 'closed research towns' near Moscow).

70. RGAE. F. 7486. D. 9314. L. 241-289; D. 9281. L. 55-66; D. 8187. L. 68-73.

In the spring of 1961, the Ministry's board prepared the relocation of the VASKhNiL and the Timiryazev Academy. Laboratories and testing stations at the farms were to be provided with the necessary equipment⁷¹. On January 11, 1962, the board discussed in detail the location of the agricultural research and production complexes in the Podolsk District of the Moscow Region. A small 'science town' for researchers was to be built in the village Novo-Mikhailovskoe to host the USSR Ministry of Agriculture, VASKhNiL, and some research institutions (fertilizers, agricultural economics and microbiology) with their testing fields⁷².

On January 11, 1963, the Minister Pyshin addressed Polyansky (the CM) to inform him that after two years none of the problems was solved: the housing for the Ministry's staff, their provision with everyday goods, good telephone connection to Moscow and the heating system⁷³. The staff therefore would be forced to travel daily by bus from Moscow to their new working place. The *Gosplan* even announced to provide for this only 10 unheated buses⁷⁴. Kosygin at least made a concession: the research staff would pay only 5 kopecks per trip, and the Ministry's costs for buses would be covered⁷⁵.

In 1963, the Khrushchev's relocation was at risk of failure, because the governing bodies provided neither the necessary finances nor the building material. On June 3, 1964, Volovchenko, the new USSR Minister of Agriculture, informed Lomako (the *Gosplan*) that the total relocation costs would be about 798 million rubles. The relocation of only 80 agricultural universities would cost 404 million rubles. If just 31 million rubles were provided annually, the relocation would have continued until 1970⁷⁶. On July 21, 1964, Krasot, the head of the main administration of the higher education, reported that only 3 of 14 institutions planned for relocation in 1962-1963 started to move to the state farms despite the lack of dormitories for students and apartments for teachers⁷⁷. On August 15, 1964, Volovchenko reported to the CC and CM on the relocation of the Ministry's agricultural universities. 17 universities were located on their testing fields and 31 – in the suburban places near their testing fields, and only 50 other universities were to be relocated. According to the plan, 32 of them were to be relocated by 1965, but the construction of the necessary new buildings started only for 8 of them due to the lack of funding⁷⁸.

71. RGAE. F. 7486. D. 8616. L. 8-68.

72. RGAE. F. 7486. D. 8691. L. 14-24.

73. RGAE. F. 7486. D. 8807. L. 3-9.

74. RGAE. F. 7486. D. 8807. L. 16.

75. RGAE. F. 7486. D. 8807. L. 59, 92.

76. RGAE. F. 7486. D. 8832. L. 143-146.

77. RGAE. F. 7486. D. 8832. L. 229-247.

78. RGAE. F. 7486. D. 8832. L. 273-304.

After the Khrushchev's removal, on November 10, 1964, Volovchenko informed the CC and CM that by the end of 1964 the relocation of 8 universities would be completed, which required the urgent construction of working and classroom buildings, accommodation, services and culture facilities (about 57 million rubles were needed). He suggested to provide the necessary means to finish such constructions for other 16 universities, while 17 universities located in suburban areas should not be relocated, i.e., the 1961 decree was changed in this respect⁷⁹. At the beginning of 1965, Brezhnev and Kosygin repealed the decree from August 28, 1961, on the relocation of the higher education, research and testing institutions, but the relocation of 18 universities were to be finished by 1968⁸⁰. The inability to provide building materials for agriculture hindered not only the Khrushchev's relocation program but also most projects of the complex mechanization of animal husbandry as depending on the high-quality constructions (Merl, 2020b).

Consequences of providing farms with defective and non-effective machinery

The *Gosplan* never managed to ensure the standardization of agricultural machinery, i.e., scarce spare parts, pulled and lifted machinery could be used only with one specific type of about 100 different tractors produced. Machinery and equipment for animal husbandry were of extremely low quality due to being produced by 150 small and poorly equipped factories subordinate to different industry ministries⁸¹. Thus, most agricultural machines and tractors at farms were defective and outdated.

Soviet factories sent their unreliable, often defective machinery also abroad – to the socialist and 'less developed' countries. The reports of Soviet engineers from these countries highlight the problems that the Soviet farms and drivers faced every day. As some of the 'less developed' countries benefited also from the Western help, their drivers were familiar with the Western machinery, and the comparison with the 'socialist' agricultural technology shocked them. Some drivers complained about the poor quality of the Soviet machinery, often completely unable to work. However, the Soviet officials named such complaints from Ceylon (1959), Syria, Iraq (1961) and other countries 'anti-Soviet propaganda'.

Ivanov, the representative of the State Committee for Foreign Economic Relations in Ceylon, forwarded a report of two Soviet engineers from July 16, 1959, who informed that the Soviet tractors and

79. RGAE. F. 7486. D. 8833. L. 44-88.

80. RGAE. F. 7486. D. 8852. L. 29-30.

81. RGAE. F. 7486. D. 9166. L. 206-265; D. 9281. L. 55-66.

pulled implements were unsuitable for the local conditions (high temperatures and precipitation) and could not work in the jungle with heavy and stony soil. The tractors had construction defects; moreover, Soviet factories often provided broken tractors, and some implements could not be used with the supplied types of tractors. The Stalingrad factory provided the DT-54 tractors without heat resistant components and coolers, and the tractors could not work on the jungle's soil. The report listed 11 major defects⁸². On February 4, 1961, the complaint of the vice consultant for economic issues of the Soviet embassy in Damascus arrived. The USSR had signed a development aid contract with Syria to provide and install water pumping systems, but the provided equipment, especially pumps from the Azerbaijan *SovNarKom*, was outdated, unsuitable, and could not work with the provided defective diesel motors⁸³.

Gushchin, the consultant on economic issues in the Soviet embassy in Iraq, complained about the bad quality of the agricultural machinery provided by the *SovNarKoms* of Belorussia, Rostov, Stalingrad and Odessa. The reports of the Iraqi media were interpreted by Soviet officials as the start of an 'anti-Soviet campaign'. The engineer-mechanics Gorbachev and Melnik confirmed that the Soviet tractors had defects: motors could not work at 45-50 degrees Celsius – they overheated, broke, their valves burnt. The poor construction of tractors (DT-54 and MTZ 5) determined that they needed repair after a few days of work, while American and British tractors worked without serious repair until amortization. The Iraqi drivers, who had used foreign tractors before, did not understand why Soviet tractors needed repair before work and why their parts did not fit together. The main problem with the DT-54 was their hydraulic systems for the lifted machinery, which broke very often and were responsible for 95% of the downtime (American tractors did not have such problems). The chassis of the *Belarus*' tractors broke very quickly, and the Minsk factory did not agree to make improvements. The pulled implements had the same problems: they were poorly manufactured and broke quickly. From 114 sowing machines not even one arrived complete and in working condition. While American tractors had a nice color for years in the hot climate, Soviet tractors lost color quickly. The engineer-mechanics stated that the situation would have been less dramatic if the Soviet factories had provided spare parts quickly. Due to the lack of spare parts tractors often worked 2,000 to 3,000 hours without repairs, and then needed a general overhaul; while the widespread American service stations changed tractor parts quickly⁸⁴.

These reports describe the problems the Soviet drivers faced. They did not react with an 'anti-Soviet propaganda' but 'voted with their

82. RGAE. F. 7486. D. 8477. L. 1-13.

83. RGAE. F. 7486. D. 8652. L. 294-301.

84. RGAE. F. 7486. D. 8659. L. 399-405; D. 8654. L. 303-309.

feet': being deeply dissatisfied with the defective machinery, uncomfortable and dangerous, after a few months of work they left the countryside for cities. Farms often complained about defective machinery and lack of parts or them not fitting together, reported that a significant number of the existing machinery could not be used due to the lack of necessary spare parts and tires. On January 4, 1957, the Ministry's board demanded to change the rules of complaints: the defective spare parts were to be changed immediately for good ones in stock. The *Glavavtotraktorosbyt* was to check samples of spare parts and send complains to the factories, i.e., defective machinery (according to the technical requirements) would not be delivered to farms⁸⁵. This proposal had little effect for many spare parts were not in stock and the industry still produced defective machinery.

In 1965, the *Soyuzselkhoztekhnik* received 6,221 complaints only about tractors⁸⁶. In the first nine months of 1968, due to the defects caused by the low quality of machinery, it sent 17,300 tractors and 63,900 agricultural machines back to factories, especially the Ryazan combine harvesters (40%) and Kharkov tractors (38%). However, the quality of most agricultural machines was low for factories did not care about the technological discipline⁸⁷.

The rules of complaints had no effect for the industry. The 15-day deadline set by the CM to react to a complaint was useless for farms for it consisted of checking rather than repair, and many factories forwarded complaints to other places⁸⁸. On May 28, 1968, Matskevich and Ezhevsky stated that the rules for complaints did not contribute to the improvements of production. As the factories did not react, farms addressed the *Soyuzselkhoztekhnik*⁸⁹. On March 1, 1968, Lebedev, the deputy of the *Gosplan*, informed the CM that factories often readdressed the complaints and suggested that heads of district divisions of the *Soyuztselkhoztekhnik* should claim compensation from factories⁹⁰. On March 22, 1968, the Commission of the People's Control proposed the CM to prolong the warranty time: farms suffered enormous losses of time on technical inspections and high expenditures on the maintenance of defective machines. Only 10% of tractors could start working without changes, 6.5% were sorted out. The low quality of the DT-75 caused a lot of complaints: in 1967, the GDR informed that 157 of 300 DT-75 provided were unreliable. 35% to 40% of the Minsk combine harvesters and most of the Ryazan potato harvesting machines K-3 were unreliable⁹¹. On July 21, 1969, Kardapolt-

85. RGAE. F. 7486. D. 8169. L. 12-15.

86. RGAE. F. 7486. D. 9046. L. 5-19.

87. RGAE. F. 7486. D. 9167. L. 183-187; D. 9242. L. 177-198.

88. RGAE. F. 7486. D. 9166. L. 53-55.

89. RGAE. F. 7486. D. 9166. L. 60-82.

90. RGAE. F. 7486. D. 9166. L. 83-84.

91. RGAE. F. 7486. D. 9166. L. 260-265.

sev again informed Kulakov that the rules of complaints did not work and demanded to oblige factories to eliminate their production defects immediately and to pay compensation to farms⁹². However, there was no effective pressure on the industry to stop producing defective machinery: the governing bodies did not care about the farms' problems, and the industry never paid compensations for the production defects and damages despite the widespread fatal accidents (defective agricultural machinery, unpacked toxic substances, etc.)⁹³. On January 28, 1955, the board stated that the work safety at MTSs was insufficient: work safety rules and systematic examination of fatal accidents were often ignored⁹⁴.

On December 11, 1965, the Komsomol CC Secretary Pavlov informed the CM about the catastrophic work-safety conditions in agriculture, which endangered drivers, serving staff and the environment. The number of fatal accidents increased by 24% from 1961 to 1963; in 1964, in the RSFSR 1,536 fatal accidents were registered. Many drivers and animal breeders suffered from occupational illnesses, but nobody cared⁹⁵. Matskevich confirmed Pavlov's description: the working conditions in agriculture, especially for drivers, did not meet the requirements of the Socialist production; many tractors and self-propelling machinery had construction defects: extreme noise, vibrations, penetration of dust and gas into the cabin⁹⁶.

Despite fatal accidents, the industry continued to produce machinery that did not meet the safety requirements. On May 12, 1969, the Lugansk *Kraikom* complained about the unsafety of the *Belarus*: in 1967, 8 tractor drivers died, in 1968 – 14. The Party Committee required to change the tractor construction according to the safety requirements: coordination of the tractor's braking with that of the pulled machines, the cabin's construction as preventing it from rolling over, etc. On August 29, 1969, Volovchenko and Ezhevsky informed the CM that in 1970 the *Belarus* was to get a better cabin, in future – with a compressed air system to brake the pulled machines⁹⁷. On March 19, 1970, Matskevich reported to the CM that due to the violations of standards by the industry more than a half of tractor drivers suffered from occupational illnesses. The number of fatal accidents was very high: 30% were caused by the tractors' rolling over, the rest – by the low dynamic reliability and insecure braking systems⁹⁸.

92. RGAE. F. 7486. D. 9207. L. 104-107.

93. RGAE. F. 7486. D. 8370. L. 71-72, 122-126; D. 8867. L. 135-152; D. 9019. L. 8-19; D. 9266. L. 329-353.

94. RGAE. F. 7486. D. 7678. L. 129-132.

95. RGAE. F. 7486. D. 9019. L. 28-32.

96. RGAE. F. 7486. D. 9019. L. 21-22.

97. RGAE. F. 7486. D. 9242. L. 44-49.

98. RGAE. F. 7486. D. 9281. L. 55-66. D. 9274. L. 110-114.

In 1955, serious problems were caused by the lack of tractors and cultivators for root crops, machines for the quadrant sowing and grain combine harvesters⁹⁹. Often the industry delivered new tractors without the necessary machinery: in 1956, 4,600 tractors were provided without plows; in 1958, caterpillar tractors were provided without some necessary parts¹⁰⁰. On January 31, 1967, Matskevich reported to the CC that often tractors were delivered to farms without the necessary implements¹⁰¹ and could not be used with the farms' implements. There were all pulled implements only for less than a half of the tractors K-700¹⁰².

The permanent lack of spare parts did not allow farms to use the available machinery. For instance, in 1955, many combine harvesters could not work technically. About 30% to 40% of the combines' working time was downtime¹⁰³. On July 9, 1958, Matskevich reported to the CC and CM that due to the lack of spare parts in the Stalingrad and Saratov Regions at the start of harvesting about 20% of combines and 26% of hay cutters had not been repaired¹⁰⁴. The lack of spare parts delayed the preparation of 100,000 tractors DT-75 for the 1968 sowing. The spare parts for cars and trucks made up only 12.3 to 65.9% of the needed¹⁰⁵. On June 13, 1962, the Ministry of Agriculture informed the CM that collective and state farms had only 35% to 40% of the needed truck and car tires. Although already a third of the farms' machines could not be used without tires, the planned figures for tires for 1963 to 1965 were reduced to 27.5 million, while agriculture alone would need 25 million¹⁰⁶.

The lack of fuel for tractors was another permanent problem during harvesting: many tractors had some downtimes due to the lack of fuel. The problem was partly determined by the outdated and unrepaired tractors with an excess need for fuel. Like every year, on August 15, 1966, the chairman of the State Committee for Material-Technical Supply complained to the CM that in the first half of 1966 agriculture received 40% of the required diesel, and 30% – of fuel. He insisted that agriculture had to use fuel more economically, but many farms could not store and use it properly. In addition to unrepaired tractors and machines, transportation, storage and refueling caused huge losses¹⁰⁷.

All data on mechanization showed 'existing' rather than working machinery. For instance, the number of wheeled tractors in working

99. RGAE. F. 7486. D. 7709. L. 171-172.

100. RGAE. F. 7486. D. 8370. L. 80. D. 7710. L. 232-235. D. 8371. L. 28-30.

101. RGAE. F. 7486. D. 9046. L. 5-19.

102. RGAE. F. 7486. D. 9266. L. 196-212.

103. RGAE. F. 7486. D. 7709. L. 156-157.

104. RGAE. F. 7486. D. 8316. L. 1-12.

105. RGAE. F. 7486. D. 9164. L. 253-258.

106. RGAE. F. 7486. D. 8704. L. 99-127.

107. RGAE. F. 7486. D. 9023. L. 124-161.

condition was significantly below the statistical reports: from 367,000 wheeled tractors registered on January 1, 1956, 61% were broken especially those working on kerosene¹⁰⁸.

Let us consider the typical local situation with the lack of machinery, transport, spare parts and fuel for harvesting on the example of Ukraine's reports to the CM in 1966. On April 27, 1966, Shelest and Shcherbitsky (the Ukraine CC and CM) informed the USSR CC and CM about Ukraine's need for 'harvest help'. In the previous year, high harvest losses were caused by the lack of harvesting machines and transport. Collective and state farms with high grain yields suffered primarily from the combine harvesters not constructed for yields above 15-20 decitonne per hectare. Also, they lacked suitable machinery for fodder harvesting and transport to collect the harvest from the fields, which did not allow to harvest fodder in time to ensure the high-quality winter fodder for the livestock. In 1966, the expected good harvest would increase the work load of the harvesting machinery and transport compared to 1965. There were only 59,600 grain combines (much less than needed), and 12,900 of them were too outdated. Only 1,600 of 6,000 requested modernized combine harvesters (like straw shredders) were provided, but none of 1,200 requested transporters for sugar beets. Shelest and Shcherbitsky urgently requested additional 3,300 grain harvesters SK-4 (with straw shredders), 800 sugar-beet and 15 flax harvesting machines, etc., but only 1,500 or 9.5% of the requested modernized machines were provided. The situation with transport was especially dramatic: many trucks and tractors could not be used due to the lack of spare parts and especially tires. The permanent lack of transport determined the temporary removal of trucks from the industry, but there still was not enough fuel. Moreover, there was a shortage of storage facilities (for about 2 million tons of the expected harvest), and the available barns and asphalt places needed repair. Shelest and Shcherbitsky stressed the need to mechanize storage to reduce the high labor input¹⁰⁹. In the following decades, there was still a shortage of the urgently needed combine harvesters with straw choppers as special trailer constructions for choppers were not provided. Cleaning and delivering the grain to the state in time became a problem as the grain cleaners (OPP-5) were no longer produced¹¹⁰.

The key problem was the shortage of machinery for large fields¹¹¹. On May 5, 1967, Matskevich and others complained to the CC that the *Gosplan* did not increase the production of tractors T-100, while the number of tractors of this hp-type at the farms decreased by

S. Merl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

108. RGAE. F. 7486. D. 8187. L. 68-73.

109. RGAE. F. 7486. D. 9022. L. 150-184.

110. RGAE. F. 7486. D. 9184. L. 5-7.

111. RGAE. F. 7486. D. 9209. L. 130-187.

half from 1959 to 1967¹¹². The industry produced only combine harvesters of a small cutting width, not suitable for large fields or even grain yields above 15-20 decitonnes per hectare. Therefore, with higher yields, grain losses increased dramatically, also due to the lack of trucks to collect the harvest¹¹³.

In addition to the lack of suitable machines, another key problem was the widespread delivery of defective machinery. On October 22, 1955, the head of the Zaoksk MTS described in detail how farms suffered from such defective machines: the potato harvester KKP-2 often broke on heavy soil and damaged a half of the harvested potatoes; the grain combine harvester S-4 was suitable only for small fields, needed serious technical changes and often broke during the grain harvest; the tractor KD-35 had defective chassis and motor, and so on. "I wish the factory improved its technology"¹¹⁴.

On April 16, 1966, Matskevich informed the CC that the main problem was the poor quality of the machinery produced by the Soviet industry; moreover, its productivity was declining, while the need for repair and maintenance was growing together with the losses of fuel. 73% of the DT-75 and 53% of the MTZ needed the first general overhaul already during the warranty time¹¹⁵.

In the fall of 1969, Kardapoltsev, the deputy Minister of Agriculture, informed the CC about serious defects of tractors and plows. At the All-Union Competition of Tractor Drivers in Tartu, Estonia, 6 of 23 tractors T-74, 5 of 20 MZZ-50L and all 23 plows PKS-4-35 showed serious defects. Thus, the agricultural technical requirements of the high-quality plowing were not met. Kardapoltsev demanded to pay serious attention to these defects as causing the farms great losses¹¹⁶.

In 1969-1970, the new tractor DT-75M was delivered to farms, although the defects revealed during testing were not eliminated and the motor produced by the Altai factory was not reliable. On February 18, 1969, Volovchenko and Ezhevsky protested to the CM against the sales by the Ministry of Car, Tractor and Agricultural Machinery Construction of the DT-75M at a price higher than agreed and despite its defects and insufficient reliability revealed during testing¹¹⁷. On July 7, 1969, Ezhevsky reported on the defective Altai motors of the tractors DT-75M and T-4 and the combine harvester SK-4. 158 of 219 tractors DT-75M' motors tested by the Krasnodarsk farms broke after 100 to 700 hours of work due to the violations of the production technology. From January to May 1969, there were complaints about 1,123 of 1,156 delivered motors, but the factory did not care. Ezhevsky

112. RGAE. F. 7486. D. 9046. L. 87-105; 5-19.

113. RGAE. F. 7486. D. 9242. L. 14-16.

114. RGAE. F. 7486. D. 7710. L. 152-154.

115. RGAE. F. 7486. D. 8961. L. 66-80.

116. RGAE. F. 7486. D. 9127. L. 184-191.

117. RGAE. F. 7486. D. 9241. L. 60-62.

asked to stop the delivery of defective motors and to order the factory to repair motors at own expense¹¹⁸. On July 21, 1969, Kardapoltsev addressed the CC Secretary Kulakov: from 617 tractors DT 75M delivered from the Volgograd Factory to farms in 1968, 534 had serious problems with motors (many engine failures and replacements of parts) which caused high losses¹¹⁹. On September 2, 1969, Ezhevsky and Kardapoltsev protested to the CM against the mass production of the Volgograd DT 75M with the Altai motors, because their major defects were not eliminated. They asked to order the urgent elimination of defects, the new testing, and the repair of tractors by the factory¹²⁰.

In 1970, at the July CC Plenum, some regional party secretaries criticized the defective agricultural machinery as responsible for huge harvest losses. Some combine harvesters were served by 6-7 people. Not the additional but the high-quality machinery was needed to increase labor productivity. However, the level of mechanization of many livestock farms was decreasing: for instance, only 12 Kazakh livestock farms were fully mechanized; in the Voronezh Region the sugar-beet harvesting was not mechanized¹²¹.

When introducing animal husbandry at large farms, the lack of transport for harvesting, especially of fodder, became a permanent problem. On August 2, 1966, Matskevich and Ezhevsky informed the *Gosplan* about the shortage of transport for the *Gosplan* included only 150,000 trucks in the Five-Year-Plan (1966-1970). For several years, the farms were receiving only a fourth of the requested transport: in 1965 – 95,000 of 382,000 trucks. The lack of transport hindered the use of fertilizers, harvesting of green fodder, constructions and the in-time delivery of agricultural products to the state; it caused standstills during the grain, fodder and sugar beet harvesting, i.e., high harvest losses: for sugar beets and corn not collected in time, 5 days of delay meant a loss of 10% of the harvest, and even higher losses for grain. In Eastern Kazakhstan, the grain harvesting usually lasted 36 to 40 days with the corresponding decline in yields from 21.5 to 4.1 decitonnes per hectare. Thus, the harvest losses due to lack of trucks were huge, and by 1970 the need for trucks would double¹²². In 1962, the US agriculture had about 3 million trucks (and additional wheeled tractors), while the USSR farms – less than 1 million¹²³ and hardly any special transport (Merl, 2020b). On October 6, 1971, Matskevich informed the CC that collective and state farms needed 1.5 million trucks, had only 0.85 million trucks, and 183,000 of them

118. RGAE. F. 7486. D. 9314. L. 5-13.

119. RGAE. F. 7486. D. 9207. L. 104-107.

120. RGAE. F. 7486. D. 9242. L. 174-176.

121. RGAE. F. 7486. D. 9266. L. 196-212.

122. RGAE. F. 7486. D. 9023. L. 74-77.

123. RGAE. F. 7486. D. 8857. L. 96-109.

urgently needed repair. 33% of trucks at collective farms and 18% at state farms were in use for more than 10 years, i.e., were outdated. Nearly all available trucks had a small tonnage. The situation became even worse, when 25% to 30% of the farms' trucks were taken by the army to transport the harvest¹²⁴.

The lack of transport at farms caused serious problems with bringing mineral fertilizers and other inputs from distant railway stations. When the Ministry wanted to increase the supply of mineral fertilizers in the mid-1950, it mentioned all problems with sending fertilizers to remote collective and state farms: construction of storages at the railway stations and at the farms, transport to bring fertilizers to the farms, machinery for applying fertilizers. The lack of transport at farms affected the railways: some freight cars waited for years to be unloaded. Moreover, the industry often provided fertilizers unpacked or poorly packed. On February 1, 1966, Volovchenko complained to the CC about the low quality of mineral fertilizers for their concentration did not meet the international standards. Only 30% of fertilizers were granulated. Fertilizers often arrived in torn bags due to not being previously cooled as abroad, which caused high losses¹²⁵. When transported unpacked and unloaded at the stations, about 10% of fertilizers spoiled in the open at the railway stations.

On January 31, 1955, Benediktov raised the transport question for the first time when addressing the CM: freight cars with machinery, tractors and building material for the Kazakh MTSs were not unloaded immediately, stood at stations for a long time, and the railway claimed penalty payments¹²⁶. On February 3, 1955, Beshchev (the Ministry of Transport) informed Kaganovich of the unloaded freight cars at several railway stations¹²⁷. Finally, on December 10, 1956, the CM ordered the railway to transport all deliveries to the MTSs itself at the beginning of 1957¹²⁸. On December 17, 1957, Gundobin, the Minister of Transport, informed the CM that the unloading of 28,162 freight cars with agricultural goods was delayed for receivers did not take them¹²⁹. On April 18, 1958, Kozlov (the Commission of Soviet Control) reported that 13,670 freight cars with mineral fertilizers stood unloaded at the railway stations: 180 cars – since 1952-1954, 860 – since 1955-1956, 6,390 arrived in 1958¹³⁰. In 1956 9%, in 1957 7.2%, and in the first quarter of 1958 15% of fertilizers were not collected by farms¹³¹. On January 12, 1961, the *Gosplan* insisted that,

124. RGAE. F. 7486. D. 9357. L. 161-165.

125. RGAE. F. 7486. D. 8961. L. 17-21.

126. RGAE. F. 7486. D. 7802. L. 148-149.

127. RGAE. F. 7802. D. 9242. L. 249-252.

128. RGAE. F. 7486. D. 8370. L. 67-70, 269-270.

129. RGAE. F. 7486. D. 8370. L. 13-15.

130. RGAE. F. 7486. D. 8370. L. 252-254.

131. RGAE. F. 7486. D. 8370. L. 248-251.

according to the 1956 CM decree, the railway was responsible for the fertilizers' transportation to the farms¹³². On March 15, 1967, the *Soyusselkhoztechnik* informed the CC and CM on the still unresolved situation with the storage of fertilizers in the open at the railway stations, which caused the loss of 6 from 30.5 million tons of fertilizers (i.e., about 20 million tons of grain) in 1966¹³³.

Defective machinery and the lack of special machinery and transport determined the farms' excessive spending on repair and fuel, huge harvest losses, and long stillstands when waiting for spare parts or tires. Therefore, farms could not reduce the labor input and costs of production. The governing bodies did not pay farms any compensations for such hardships and blamed them for all the problems.

The Party's choice: local officials' fault and 'socialist competition'

The party leaders (Khrushchev and Brezhnev) followed the traditional path of blaming the lower officials for the regime's mistakes and of appealing to the workers for raising productivity without providing them with the efficient machinery. As with perfect machinery everyone can achieve good results, the defective machinery was a precondition for declaring workers 'heroes' of the 'socialist competition'.

In 1955, there was a rumor that the MTS machinery would not allow to harvest the planned amount of hay in 7-8 days (which was unrealistic) in order to put pressure on drivers¹³⁴. For fulfilling the MTSs' plan for corn harvesting only by 9.5% and for not providing fodder for collective farms the lower MTS officials were blamed – for not using the machinery efficiently¹³⁵. The MTSs were blamed for the excessive spending on repair for its costs exceeded the planned ones¹³⁶. On October 26, 1967, Kardapoltsev, the deputy minister, informed the CC that collective farms often wrote machinery off too early: in 1966 – 16% to 24% of tractor plows, 11% to 32% of corn combine harvesters in different regions. However, he admitted that much of the agricultural machinery of farms was technically and morally outdated¹³⁷. On June 27, 1968, Kobanov (the Committee of the People's Control) reported to Kosygin that the farms' shortcomings were close to the criminal negligence: agricultural machines, including the imported equipment, stood in the mud or snow¹³⁸. On January 7, 1969, Matskevich informed the CM, according to its request 'to protect ag-

132. RGAE. F. 7486. D. 8659. L. 21-28.

133. RGAE. F. 7486. D. 9103. L. 118-127.

134. RGAE. F. 7486. D. 7678. L. 58-68.

135. RGAE. F. 7486. D. 8183. L. 192-193.

136. RGAE. F. 7486. D. 7678. L. 48-57.

137. RGAE. F. 7486. D. 9046. L. 158-161.

138. RGAE. F. 7486. D. 9167. L. 46-49.

ricultural equipment', that not only the outdated machinery was written off¹³⁹. On February 14, 1969, Matskevich, Ezhevsky and others informed the CM that, despite the increased supplies, the number of machines in collective and state farms was less than planned. Sometimes tractors, combines and melioration equipment were written off for no good reason. They demanded a better use of the available machinery and an increase in the drivers' motivation to maintain it¹⁴⁰. Matskevich was aware of the agricultural machinery defects but continued to blame local officials: on April 2, 1968, he accused Rashidov (the CC of Uzbekistan) and Kurbanov (the CM of Uzbekistan) of the shortcomings in the use and maintenance of the machinery in Uzbekistan. Although they received new machines, the labor productivity remained low, while the costs of the machinery repair and technical maintenance kept growing¹⁴¹.

Goroshkin, the deputy chairman of the State Committee for Labor and Remuneration, suggested to award tractor drivers for the low fuel consumptions and to punish them for the excessive fuel consumption 'due to the driver's fault' with 60% of the costs. On October 11, 1966, Sidak (the deputy Minister of Agriculture) warned about the consequences: the threat of punishment for more than 30% 'excessive fuel consumption' was not economically reasonable for the tractor drivers would refuse to take tasks with a high risk of the excessive fuel consumption¹⁴².

The complex mechanization depended on the qualified workforce. While the lack of tractors and combines was the main problem in the 1950s, from the 1960s onwards it was the lack of well-trained people to drive and repair tractors and combines. Defective tractors, the high risk of occupational illnesses and fatal accidents determined an increasing turnover of trained drivers, i.e., the human resources were wasted: when the trained people left for cities, new drivers were trained, which is why the majority of drivers had little experience and knowledge.

On April 16, 1966, Matskevich informed the CC that a better use of tractors depended on the availability of drivers. From 1962 to 1964, 953,000 drivers were trained, while 800,000 – 89% of drivers – left the countryside. Such a high turnover (most tractor and combine drivers left after 15 months on collective farms or 14 months on state farms) was determined by the negative work experience and seasonal employment. Often there were no engineers, mechanics¹⁴³ and agricultural specialists: graduates were to move to special regions and farms,

139. RGAE. F. 7486. D. 9241. L. 1-3.

140. RGAE. F. 7486. D. 9241. L. 29-43, 48-59.

141. RGAE. F. 7486. D. 9127. L. 50-52.

142. RGAE. F. 7486. D. 9019. L. 66-72.

143. RGAE. F. 7486. D. 8961. L. 66-80.

but refused to do so¹⁴⁴. Thus, in 1965, 7.5% of 20,000 university graduates did not come to the prescribed collective and state farms. The situation with graduates of agricultural schools was even worse: for instance, in Ukraine, 24.3% of graduates did not come to the prescribed farms. However, even if the graduate arrived, he was of little help for farms – many were soon drafted into the military and never returned¹⁴⁵. On September 21, 1966, Matskevich informed the CM on many complaints about the increase in the turnover of specialists. As one reason was the low salary, he required a significant increase in wages¹⁴⁶. However, instead of raising wages, from the mid-1960s onwards, the Party tried to prevent the high turnover by the honorary titles for agricultural workers and celebration of the ‘agricultural worker’s day’. On October 6, 1966, the board discussed the draft decree ‘On celebrating the agricultural worker’s day’¹⁴⁷ as the All-Union public holiday¹⁴⁸.

In 1966, such honorary titles as the ‘honored agronomist of the RSFSR’ were granted on the personal application¹⁴⁹. On June 10, 1966, Matskevich suggested to the CM to introduce such titles as the ‘honored livestock technician of the republic’ with the salary increment of 10 rubles¹⁵⁰. On February 3, 1967, the board discussed the Order of Labor Glory for agricultural workers and members of collective farms¹⁵¹. On September 1, 1967, Matskevich and Ezhevsky suggested to the CC to introduce honorary titles for tractor and combine drivers: ‘honored representative of the Soviet agricultural mechanization’, ‘honored tractor/combine driver of Soviet agriculture’¹⁵². On July 25, 1968, other new titles were discussed – ‘collective of communist work’ (with some special regional requirements), and ‘master of animal husbandry’ (first-class master, second-class master, etc.)¹⁵³.

The idea to raise labor productivity by awarding honorary titles reached its peak in 1971. In spring, Matskevich with colleagues sent the CC a draft decree ‘On measures to strengthen the moral reward for good production results’, which suggested awarding farms with orders and the best workers – with the title ‘hero of socialist work’, orders and medals. At that time, every year 65 to 75 best farms and 20,000 to 30,000 best workers were awarded, and the number of best workers was to be increased by 10–15,000. New honorary titles were introduced: for instance, for female tractor drivers – a medal named

144. RGAE. F. 7486. D. 9020. L. 24-27.

145. RGAE. F. 7486. D. 9020. L. 47-59.

146. RGAE. F. 7486. D. 9019. L. 33-37.

147. RGAE. F. 7486. D. 8947. L. 210; D. 8961. L. 100.

148. RGAE. F. 7486. D. 9127. L. 162-166.

149. RGAE. F. 7486. D. 8961. L. 178-188.

150. RGAE. F. 7486. D. 9018. L. 228-234.

151. RGAE. F. 7486. D. 9036. L. 19-38.

152. RGAE. F. 7486. D. 9046. L. 147-154.

153. RGAE. F. 7486. D. 9116. L. 278-299; D. 9195. L. 277-283.

after Pasha Angelina. To award research and training institutions and administrative bodies, the honorary certificates of the CC, CM and Unions were to be introduced. 1,455 honorary diplomas of the Ministry of Agriculture, the CC of the Union of Agricultural Workers could be awarded together with 1.5 million rubles of cash rewards. The republics were to follow the same path. To attract public attention to the work results, the All-Union consultations of best workers were to be organized¹⁵⁴.

Although the state would have profited from the reduction of production costs and labor input, it used the poor quality of agricultural machines to strengthen the political stability. Not the industry but the local officials were accused of the 'irresponsible' maintenance of the farms' agricultural machinery. From the mid-1960s onwards the state strived to enlist the workers' support by awarding them with honorary titles and orders and wasted huge resources on increasing workers' motivation. Awards were granted mainly for physical efforts and revealing stopgaps. However, the impact of such measures on labor productivity or production came to naught.

Alternatives: the transfer of the production responsibility to farms

How did the heads of state and collective farms together with workers assess the state agrarian policy? There is very little 'uncensored' data on this issue, which shows that some qualified farm leaders were fed up with the permanent interference from above. They could manage production and increase its efficiency themselves. As the mood of Czech agricultural workers and farm directors was quite similar to that of their Soviet colleagues, let us consider their demands that were openly expressed during the Prague Spring of 1968.

On February 20, 1968, Matskevich reported to the CC on the most important events at the second CSSR Cooperative Congress in Prague. The Czech economic reforms in agriculture, processing industry and agricultural machinery production suggested that the system of industrial associations needed special services for supplying agriculture in order to improve cooperation between cooperatives and processing plants. Cooperatives' responsibility for production should be strengthened and the unnecessary parts of the state administration eliminated. The Party Secretary Dubchek praised the work of peasants and admitted that they did not need any extra instructions on when to start sowing or harvesting. The task of the central administration was reduced to providing favorable conditions for the development of agricultural productive forces. Dubchek mentioned the large number of complaints about the lack of fertilizers and high prices for the poor-quality agricultural machinery produced in the CSSR,

154. RGAE. F. 7486. D. 9356. L. 77-108.

GDR and USSR. Some delegates required that the farms were given money to purchase any agricultural machines they wanted. Other delegates opposed specialization and planning. They wanted to decide themselves which production branches would be most profitable for development. Many delegates opposed the state interference in the construction of poultry farms for cooperatives could handle it themselves. Matskevich stressed that ‘demagogic statements against ministries’ found broad support, when Frantisek Kunc demanded to free the cooperative system ‘from top to bottom’ without new slogans and obligations as cooperatives knew better what to produce¹⁵⁵.

Khudenko’s reform would require the transfer of responsibility to the farm workers – teams and brigades working without the rules set from above (*beznyarado-zvenievaya sistema*). He considered the centralized standards for labor organization and remuneration unnecessary and even harmful. After testing the proposed reform at the Iliysk state farm in Kazakhstan for the second time, Khudenko developed the ‘general principles’¹⁵⁶ for organizing the work and remuneration at farms: the state farm was to get its production tasks for 3-5 years in advance, including the planned costs, wage funds and capital investments; the production unit (team) in the mechanized crop production was to consist of 4-5 drivers working together during the whole contract period; the team was to be formed on a voluntary basis from ‘broad specialists’ (combine/tractor/truck driver); 750 to 1000 hectares of agricultural land, tractors, combine harvesters and trucks were to be provided for the team; the driver’s workload was to be 2000 standard hours a year; the monthly payment was to be calculated on the basis of standard hours, while the final payment – on the basis of production results (harvest)¹⁵⁷. This Khudenko’s proposal resembled the working principle of the *shabashniki* – temporary contract teams engaged, for instance, in construction projects and paid for the built house.

Khudenko had support from above when tested his reform for the first time. There were more opportunities for experiments under Khrushchev, and he did not ask for any additional help from the state. Khudenko wanted to prove that the work could be done with less machinery and labor input provided the high motivated drivers due to their self-organization and own responsibility. On November 12, 1960, the Commission on Ongoing Affairs of the CM approved the testing in the virgin-land region in Kazakhstan¹⁵⁸. The testing was a great success in the economic perspective: the whole farm work was done by only 60 (of 863) workers and with only 60 (of 150) tractors. The participants were organized into 6 teams with 10 drivers and 10 trac-

155. RGAE. F. 7486. D. 9130. L. 4-12.

156. RGAE. F. 7486. D. 9018. L. 241-244.

157. RGAE. F. 7486. D. 9046. L. 60-66.

158. RGAE. F. 7486. D. 9046. L. 62-66.

tors each. However, the workers no longer needed for production expressed dissatisfaction, and Khudenko was made responsible for the unrest (Yanov, 1984: 31-33). Thus, on August 31, 1962, the CM Presidium received a recommendation to withdraw the testing permission¹⁵⁹. According to Matskevich, the 'specialists' came to the conclusion that the proposed reform would reduce the material incentives for drivers, and that the reduction in the number of workers would lead mainly to savings¹⁶⁰. As raising the USSR's poor labor productivity was at the top of the political agenda this sounds rather strange, but ideology triumphed over economics, and Matskevich protested against further testings.

However, Khudenko, got a second chance when he became the head of the Iliysk state farm in the Alma-Ata Region in March 1963. The report from October 15, 1965, mentioned that the farm's production increased significantly in 1963¹⁶¹. The economic results of this testing in 1963-1965 were impressive, but it again caused workers and officials' dissatisfaction. The officials' goals were contrary to the core of the experiment's success – the reduction of the labor input and of the number of machines. However, there were also protests against stopping the experiment. On April 29, 1965, in the *Komsomolskaya Pravda*, Elemanov (the deputy Minister of Agriculture of Kazakhstan and the corresponding member of the Kazakh Academy of Sciences) denied all accusations (of the sharp reduction of workers and of Khudenko not providing enough machinery to the teams) and stressed that such an organization of labor was widespread in the US and Australia¹⁶². On February 5, 1966, Elemanov informed Kosygin that changes in the old system of work organization and remuneration were necessary, that standardization should be applied not to separate work operations but to the final product, and that workers rather than 'external specialists' should organize their work. Elemanov described the work of the Iliysk state farm: from 3 complex and 9 plant brigades 17 teams were formed; each team got 4 tractors, 5 combine harvesters and other machinery; instead of the average 830 workers, the new labor organization needed only 67 drivers, and instead of the large management – only two leading specialists (a chief agronomist and a chief accountant); each team worked on 3,000 hectares of arable land with the task to produce 500 tons of grain per worker; due to the high labor productivity, the salary of the driver increased to 330-350 rubles. Elemanov asked Kosygin's permission to continue the experiment¹⁶³.

Kaminsky, the engineer and the Party member since 1926, addressed the CC Agricultural Department after reading the article in

159. RGAE. F. 7486. D. 9046. L. 62-66.

160. RGAE. F. 7486. D. 9046. L. 60-66.

161. RGAE. F. 7486. D. 9018. L. 254-258.

162. RGAE. F. 7486. D. 9018. L. 245-248.

163. RGAE. F. 7486. D. 9018. L. 116-126.

the *Komsomolskaya Pravda*. He stressed that Khudenko's approach was close to the Russian national character as successfully breaking bureaucratic structures. He mentioned that under the given work organization peasants lacked freedom to decide on production, and regretted that the CC Agricultural Department had not followed such healthy ideas. As the agricultural situation worsened, the 1965 CC Plenum had to take action by choosing between two paths: to reduce the costs of agricultural production by using Khudenko's experience or to increase wages according to the farm labor and resources expended. The 1965 CC Plenum chose the second path and put the CC Agricultural Department in charge, i.e., bureaucrats, dogmatists and reinsurers were to make decisions in order not to let the 'producers of material goods' get rich¹⁶⁴.

Nevertheless, there were hidden heated debates on Khudenko's reform until 1969. Most of its harsh critics held leading position in the apparatus, but it was supported by some Politburo members (Voronov), representatives of the Novosibirsk branch of the Academy of Sciences (Aganbegyan, Zaslavskaya) and journalists (Yanov, 1984: 33-34). In 1967, despite Kosygin's refusal to resume testing¹⁶⁵, Khudenko (with the support of the deputy Minister of Agriculture of Kazakhstan) got the chance to establish a new testing state farm to produce lucerne with the needed number of workers and machinery on the uncultivated land in Akchi of the Alma-Ata Region. The farm did not have any administration – only 60 workers who formed 11 teams on the commercial basis of payment: 6 teams for farming, 1 – for repair and spare parts, 1 – for the purchase of seeds and fertilizers and for the sales to the state, 1 – for construction, 1 – for public catering, and 1 – for coordination (agronomist Li and accountant Khudenko) (Yanov, 1984: 34-39). The aim was to test the work remuneration that would increase labor productivity and reduce inputs to the necessary level. The project was stopped from above, if Yanov (1984: 120) is correct – by Brezhnev's order. According to Volovchenko, the aim to increase labor productivity implied the 'increase in labor intensity', which was not allowed in the 'socialist production'. He also commented on the teams' payment as based on the final results of production that such workers did not get plans and did not know the level of production above which they would get additional rewards¹⁶⁶.

Thus, Khudenko showed that when people worked on their own, the commanding officials were unnecessary and the number of machines and workers could be reduced significantly. Responsibility for production costs made the teams take only the needed machinery and maintain it carefully, which eliminated the widespread feeling of *obezlichka* (irresponsibility). In 1970, after testing his ideas three times

164. RGAE. F. 7486. D. 9018. L. 249-253.

165. RGAE. F. 7486. D. 9018. L. 264-265, 282-283.

166. RGAE. F. 7486. D. 9275. L. 64-66.

with the convincing economic results, Khudenko was finally stopped, then arrested for 'corruption', and died in prison in 1974. However, in the 1980s, his ideas were revived in the form of 'contract teams and brigades'.

Investments and actions requested by the Ministry of Agriculture for the FYP 1971-1975

On November 6, 1964, just after Khrushchev's displacement, Volovchenko sent to Polyansky (the CM) a report on the state of agriculture, in which he stressed that its labor productivity was several times lower than in the US. The capital stock of the USSR agriculture was increasing too slowly, with only a 20% share of energy resources and machinery. In terms of energy supplies, the Soviet agriculture lagged far behind capitalist countries: in the US, the use of electricity was 14 times higher, and 4 times more tractors and combines were used for every 100 hectares of arable land. Volovchenko demanded to expand the industrial production of tractors, combine harvesters, trucks and agricultural machinery. After the liquidation of the MTS, the technical maintenance of tractors worsened, and farms did not have enough tractors and machinery to finish field works on time¹⁶⁷. Matskevich repeatedly reported on the poor development of the complex mechanization: on December 17, 1969 – to the CC, on March 19, 1970 – to the CM, and on December 8, 1971 – to the CC¹⁶⁸.

In December 1969, Matskevich and Ezhevsky complained about long delays in the start of the mass production of new agricultural machinery, which hindered the development of the complex mechanization and kept the high labor input in agriculture. The orders of the CC 1968 Plenum to speed up the introduction of complex technologies were not executed. The *Gosplan* kept delaying the start of the mass production of the successfully tested machines; therefore, farms were forced to use outdated machinery or to do manual labor. Among the machines recommended for production some years ago were the caterpillar tractor T-130, the cotton tractor MTZ-50X, the sugar beet combine harvester AMK-2, and the portable irrigation apparatus CDA-I. Matskevich and Ezhevsky underlined that the highest labor input in grain production was in collecting straw: the grain harvesting per hectare took 2.5 hours, while collecting straw – 11.8 hours. Every year huge amounts of straw needed for animal husbandry was not collected from the fields due to the lack of the necessary machinery and transport. Other great losses were determined by the lack of equipment for cleaning and cooling milk. In total, about 100

167. RGAE. F. 7486. D. 8857. L. 96-109.

168. RGAE. F. 7486. D. 9207. L. 213-216; D. 9281. L. 55-66; D. 9357. L. 289-234.

highly effective and successfully tested machines were not put into mass production by the *Gosplan*¹⁶⁹.

In his report from March 1970 'On the technical level of the USSR agricultural production in the international perspective', Matskevich stressed the low labor productivity due to the insufficient energy resources and funding: in 1968, the USSR had only 8.2 (the US – 36.5) tractors per 1,000 hectares of agricultural land, 4.4 (13.5) combine harvesters, and 0.6 hay bales (31.4). The supply tasks set by the 23rd Party Congress in 1966 were not solved. Thus, the grain harvesting took 18-20 days, silage harvesting – 15-18, potato and sugar-beet harvesting – 25-35, which determined high harvest losses – about 35-40 million tons of grain per year. The outdated tractors consumed too much fuel and rarely managed to work without major repairs during the warranty time (4,000 working hours). Due to technical defects, the average tractor downtime was about 14% of the shift, which was several times longer than in capitalist countries. There was a huge shortage of machinery for animal husbandry, and the available equipment for manure cleaning usually worked for only three years. Just some fully mechanized branches of the Soviet agriculture showed a significant increase in the labor productivity, for instance, poultry husbandry in the Baltic countries. Matskevich named the lack of agricultural machinery for fodder harvesting as the key reason for the low productivity in animal husbandry. Due to the lack of transport 20-25% of hay and 30-45% of silage were lost. Moreover, the fodder did not contain enough protein, and the production of concentrated feed did not grow¹⁷⁰.

In December 1971, in his report 'On the scientific-technical progress in agriculture' Matskevich argued that manual work and work with horses still accounted for 70-75% of the total work input in the Soviet agriculture. The lack of agricultural machinery hindered the development of horticulture and wine production, and mechanization of animal husbandry affected just a limited number of operations. Only the complex mechanization could significantly reduce the work input in agriculture, but the quality of most Soviet machines was far behind the developed countries, for instance, in terms of the tractors' engine power (hp), productivity, and fuel consumption. Only the Vladimir and Chelyabinsk tractor factories and the Yaroslavl motor factory produced motors which met the fuel-consumption standards of that time, while most Soviet tractors and combine harvesters had outdated motors consuming too much fuel, which were produced by the Kharkov, Minsk, Altai and Rybinsk factories. Most produced agricultural machines were outdated and did not meet the world technical standards. From 700 Soviet tractor types, only 5 received the quality certificate. Matskevich underlined that farms also suffered

S. Merl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

169. RGAE. F. 7486. D. 9207. L. 213-216.

170. RGAE. F. 7486. D. 9281. L. 55-66.

from high prices for new machinery, which limited the use of wheeled tractors. Nevertheless, he stressed that the supplies of poor-quality machinery were no longer acceptable, because it needed too much effort to operate¹⁷¹.

By August 1, 1982, the level of mechanization had hardly changed since 1971: still 68.6% of agricultural workers used only manual labor, only 26% were engaged in the mechanized work (including supply and side production). While in crop production 27% of workers at state farms and 23.6% at collective farms were engaged in mechanized work, the situation in animal husbandry was worse: 19.4% of workers at state farms and 8.4% at collective farms were engaged in mechanized work¹⁷².

On July 4, 1969, Matskevich presented (on the request of the 1968 CC Plenum) draft plans for the development of animal husbandry during the Five-Year Plan (1971-1975) with special sections (detailed information on measures, needed investment and imports)¹⁷³: development of milk production; industrial cattle fattening; livestock breeding; improvement of feed production technology, fodder storage and concentrated feed; rational use of hay and meadows; development of veterinary services; livestock diseases control, and so on. Matskevich stressed that costs of animal husbandry had increased significantly since 1962, mainly due to the high fodder losses and poor quality of feed which were determined by the lack of machines for feed production, lack of spare parts for available machines, lack of special storages for fodder, lack of bales and hay-drying equipment. Thus, feed costs made up 40-60% of total animal husbandry costs.

On May 4, 1971, Matskevich and Ezhevsky again informed the CC on the urgent need to mechanize the feed production in order to reduce the fodder harvesting time and, thus, to increase the quality of hay. Due to the lack of necessary machinery, hay harvesting often took 50 to 60 days, which caused the loss of nutritional value: about 1 million tons of hay protein was lost annually. Due to the lack of machinery, storage and packing material, many farms stopped to use silage¹⁷⁴.

Striking continuity: the shortcomings of agricultural production named by the Gosagroprom in 1986

On June 25, 1986, the *Gosagroprom* Committee discussed 'The design and production of a new machinery system for the complex mechanization of crop production and animal husbandry' during the Five-

171. RGAE. F. 7486. D. 9357. L. 189-234.

172. RGAE. F. 650. D. 331. L. 1-104.

173. RGAE. F. 7486. D. 9208-9209.

174. RGAE. F. 7486. D. 9356. L. 162-164.

S. Merl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

Year Plan (1986-1990). The complex mechanization was to be carried out ‘in a short time’ – by 2000 – with the complex program to raise the quality of agricultural machinery¹⁷⁵, which was not a new task. Three decades earlier, the complex mechanization had become a standard for the developed Western countries. Already in the mid-1950, the Ministry of Agriculture demanded to copy the Western experience and started to import the high-quality Western models of agricultural machinery (Merl, 2020b). In 1969, the Ministry of Agriculture made a second attempt with the detailed draft decrees on the complex mechanization of animal husbandry during the FYP of 1971-1975. In 1986, 1960 and 1975 were changed for a new deadline – 2000 – for the complex mechanization, which was an obvious declaration of failure: the political system could not solve the task.

The third attempt followed the same path: like in the 1950s and in the second half of the 1960s, the ‘effective cooperation’ of the research and production of new machinery was to check all types of agricultural machinery for its compliance with the scientific-technical progress, for the reduction of time between designing and the start of mass production, for the technological ability to perform several operations at the same time, and for higher quality requirements. The production of more advanced and high-quality machinery was to be ‘speed up’, which was a banal obvious task not even worth mentioning by the *Gosagroprom* for Soviet monopolist factories did not produce reliable, efficient agricultural machines. In 1986, only one task was partly new: to increase ‘the economic influence of clients on the production of high-quality agricultural machinery’¹⁷⁶.

Despite the resolution’s common phrases, the speeches ruthlessly stressed the crucial shortcomings of the system that made the farms work with unreliable and poor-quality machinery. Ermin, the head of the RSFSR *Gosagroprom*, said that after the start of the non-black-earth program in 1974 nothing really changed: after 12 years, still no machinery suitable for the region was produced, although only wheeled tractors could increase yields on such soils. At that time, the key problem was the low quality rather than the lack of agricultural machines: there was no reliable machinery for animal husbandry, and even ‘new’ technologies were already outdated. Prices for inputs were too high, and often prices for the ‘improved’ machinery exceeded the real gain in productivity: for instance, the tractor K-700 was 50% more expensive but increased labor productivity only by 20%. Moreover, the industry still ignored the safety issues: neither the driver’s cabin nor his seat was safe.

Ermin demanded from the industry to produce complex and high-quality machinery of all necessary types. Until then, mechanization had hardly reduced labor input, and the farms’ costs were

175. RGAE. F. 650. D. 16. L. 1-57.

176. RGAE. F. 650. D. 16. L. 1-4.

growing instead of falling. There was hardly any mechanization of feeding in animal husbandry, about which farms were complaining in vain for years. Some of the needed machines, especially for silage production, were never produced, while others were out of production. The time for producing silage was still three times longer than necessary, and every year a half of green harvest was classified as fodder of low quality. It was impossible to produce high-quality silage without the necessary machinery, but the replacement of outdated machines in feed production was slower than in any other branches of animal husbandry. There was also a shortage of machinery for harvesting, sorting and processing of vegetables and fruits. 12 years after the CC and CM promised new machinery for the non-black-earth region, still no combine harvesters and machines suitable for the region were provided. The available machinery could not work in rainy seasons and on the soil that needed low tillage. Ermin mentioned that the trade image of the Soviet agricultural machinery was its low quality and unreliability. Nearly all machinery produced for animal husbandry was defective, as also were many brands of plows, cultivators, and potato harvesting machinery. Moreover, the defects of the combine harvester KSK-100 were known for a long time, but no new combine harvesters were to be designed and produced before 2000¹⁷⁷.

Motorny, the chairman of the collective farm with good results in Kherson, complained bitterly about the lack of high-quality machinery: “We do not need more tractors, we need tractors of a better quality”. The farms lacked sowing machines and tractors with the necessary machinery (for instance, the T-150 was provided with just one cultivator). Motorny stressed that people were tired of the situation and lost trust in the state. He demanded the production of reliable combine harvesters (like produced in the GDR) and wondered why the industry provided so many poor-quality tractors and pipes instead of few reliable and high-quality ones. The Altai tractors permanently lost oil, but good metal was wasted for such junk; spare parts were suitable only for a special type of tractors or machines; many tractors were ‘modernized’ without any impact on productivity, and so on¹⁷⁸.

Cherdintsev, the team leader from Orenburg with a 43-year harvesting experience, stressed the dissatisfaction of workers who were forced to use manual labor due to the poor-quality machinery in animal husbandry. For instance, manure transporters were so poorly constructed that could not collect manure when fattening 6,000 head of cattle; farms had round bales, but no transport to collect them; the combine harvester KSK-100 was of such poor quality that nobody wanted to work on it. Only for three years the Soviet industry

177. RGAE. F. 650. D. 16. L. 5-11.

178. RGAE. F. 650. D. 16. L. 18-21.

was producing new combines Don-1200 and Don-1500 which worked great and provided comfort for the driver¹⁷⁹.

The director of the model state farm with the comparatively high labor productivity in Krasnoyarsk complained about the poor quality of machinery: thus, the plows damaged the soil, and many herbicides were needed, which meant ‘wasting millions of rubles’. He bitterly complained that often the relatively reliable machines were replaced by more defective or unsuitable. At his farm, for feed production they used the KPS-5I and the KSK-100, but his best drivers “were used to improving the defective machines produced by the industry: in the end, nothing was left from the original version”. High-quality feed production machinery was only delivered from abroad: for instance, the GDR mower had a cutting width of 4 meters, so the hay dried up after a few days, while the Soviet mower had a cutting width of 5 meters, so the hay did not dry but rotted in swaths. Animal husbandry urgently needed transport for silage, machines for spreading manure and workers¹⁸⁰.

The academic of the VASKhNIL Kryazkov, the director of VIM, made a crushing verdict on the Soviet agricultural machinery: about 80% did not meet the requirements. However, Soviet constructors should not be blamed – the problem was that the mass production of new machines had never started. Soviet agricultural machines were poorly made, unreliable and unstandardized, they caused the farms high costs for maintaining and repair. The industry was not responsible for its machinery, the farms did not participate in its testing, and the officials making decisions about production did not take into account the issues of repair¹⁸¹. Kelpis, the head of the Riga GSKB, accused the *Gosplan* of that new machinery often showed good results when tested, but, when put into mass production, only the lowest possible costs were taken into account. He described the situation with the complex mechanization of dairy production: some farms were close to the world standards, but the high-quality milking equipment was used just for 3% of cows, while 79% of cows were still milked with buckets¹⁸².

Conclusion

Thus, there are several decisive factors of the failure of the complex mechanization:

- The lack of state support for solving basic tasks after Stalin, especially for the development of animal husbandry at large

179. RGAE. F. 650. D. 16. L. 22-24.

180. RGAE. F. 650. D. 16. L. 25-30.

181. RGAE. F. 650. D. 16. L. 40-45.

182. RGAE. F. 650. D. 16. L. 54-57.

S. Merl

Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture...

farms. The governing bodies never provided the investment necessary for a fundamental reconstruction of the agricultural machinery industry, which determined the lack of high-quality feed harvesting machinery and transport in agriculture, and the waste of scarce resources in industry. The poor-quality machinery caused the farms high costs of maintenance, high consumption of spare parts and fuel, high harvest losses, and the need for a quick replacement of machinery. Thus, 'mechanization' hardly affected the agricultural labor productivity, and the official data on mechanization was 'fake' due to counting available rather than working machinery.

- No changes in the agricultural policy: following Stalin's precepts, the governing bodies, especially under Khrushchev, did not trust collective farms and feared their 'enrichment'. Although the basic conditions for working by themselves were not provided and the state purchase prices for animal products did not cover the production costs, the farms were to make investments. Without the complex mechanization, the desired reduction of labor input and increase in efficiency were not possible.
- The governing bodies' refusal to abandon the state command system in agriculture. Although in 1931 the responsibility for production in industry was transferred to the factories' directors, this never happened in agriculture. Most heads of collective and state farms were well qualified, but the state continued to interfere into their production. They could not buy the machinery they needed; therefore, farms never had enough high-quality transport and machinery in working condition to complete all steps of production on time. This contributed to the lack of personal responsibility for the means of production (*obezlichka*). Khudenko's reform based on the independent contract brigades was blocked under Brezhnev.
- Following Stalin's precepts, the governing bodies blamed farms and local authorities for shortcomings of mechanization which were actually determined by defective machinery. The Party leadership announced the 'socialist competition' to motivate the agricultural workers and introduced special honorary titles and orders. There were many awards and cash bonuses for production results and yields that were extremely poor in the international perspective. Without providing the high-quality means of production, Brezhnev's policy to raise wages and to improve living conditions in the countryside could not compensate for dissatisfaction with work. The well qualified younger generations needed for the complex mechanization left the countryside for cities, which determined a high turnover of workers in agriculture.

The basic shortcomings named by the Ministry of Agriculture in 1955 and in the late 1960s were the same the *Gosagroprom* named in 1986. The governing bodies either did not care or did not manage to eliminate the well-known shortcomings. They allowed the agricultural machinery factories to act as monopolists and blocked all direct contacts between the machinery producers and farms. Khrushchev's campaigns caused long-term harm to agriculture, while Brezhnev's campaigns never provided the promised high-quality inputs but contributed to the ever-increasing waste of scare resources.

References

- Merl S. (2020a) Agricultural reforms in Russia from 1856 to the present: Successes and failures in the international comparative perspective. *Russian Peasant Studies*, vol. 5, no 2, pp. 56–87.
- Merl S. (2020b) Why the Soviet Union under Khrushchev and Brezhnev failed with the complex mechanization of agriculture: International aspects (1953–1986). *Russian Peasant Studies*, vol. 5, no 4, pp. 78–117.
- RGAE (Rossiisky Gosudarstvenny Archiv Ekonomiki) [Russian State Economic Archive], Fond 7486 (Narodny kommissariat zemledeliya SSSR), Opis 1.
- RGAE (Rossiisky Gosudarstvenny Archiv Ekonomiki) [Russian State Economic Archive], Fond 610 (Gosagroprom), Opis 1.
- Yanov A. (1984) *The Drama of the Soviet 1960s. A Lost Reform*, Berkeley: University of California.

Почему Советский Союз при Хрущеве и Брежневе не смог провести комплексную механизацию сельского хозяйства: внутренние проблемы страны (1953-1986)

Штефан Мерль, доктор исторических наук, профессор Билефельдского университета. Университетштрассе, 25, 33615, Билефельд, Германия.
E-mail: smerl@uni-bielefeld.de

Аннотация. В статье представлены результаты поисков ответа на вопрос, почему при Хрущеве и Брежневе Советский Союз не смог провести комплексную механизацию сельского хозяйства, но, в отличие предыдущей публикации, акцент сделан на внутренних проблемах страны. Автор полагает, что командно-административная система не смогла решить основную для сельского хозяйства задачу – обеспечить развитие животноводства на базе крупных сельскохозяйственных предприятий, и главной причиной было отсутствие высококачественного оборудования, которое бы позволило снизить трудовые затраты и издержки производства. За впечатляющим фасадом якобы великих реформ (освоение целинных земель, ликвидация машинно-тракторных станций, обещание Брежнева в 1966 году ускорить механизацию и программа 1974 года по развитию Нечерноземья), по сути, ничего не менялось. Ключевые недостатки сельскохозяйственного машиностроения, озвученные еще в 1955 году, не были устранены ни в 1969 году, ни после создания Госагропрома в 1986 году: практически вся сельскохозяйственная техника была плохо сделана и ненадежна, а потому наращивание масштабов ее производства при Брежневе было бессмысленной тратой ресурсов (уже тогда менее 10% техники соответствовали мировым стандартам последнего десятилетия). Вместо

того, чтобы увеличивать производительность труда, сельскохозяйственная техника приносила хозяйствам (и государству) огромные убытки. Провалы механизации (в первую очередь, отсутствие транспорта и техники для сбора кормов) приводили к тому, что большинство работников сельского хозяйства (70% в 1982 году) все еще занимались ручным трудом. В конце 1960-х годов министерство сельского хозяйства направляло в Центральный комитет и Совет министров панические отчеты о состоянии сельского хозяйства, безрезультатно требуя срочных мер и инвестиций в модернизацию сельскохозяйственного машиностроения, чтобы обеспечить соответствие техники мировым стандартам к 1975 году. В статье описаны проблемы в развитии животноводства, последствия таких государственных кампаний, как освоение целинных земель, превращение колхозов в совхозы и ликвидация МТС, предлагаемые варианты организации труда и его оплаты в сельском хозяйстве, а также состояние сельского хозяйства в 1955, 1969 и 1986 годы.

Ключевые слова: сельскохозяйственная модернизация, комплексная механизация, сельскохозяйственное машиностроение, эффективность сельскохозяйственного производства, производительность сельскохозяйственного труда, социалистическое соревнование, Хрущев, Брежнев, Худенко