

# Bread of South Ural: Grain Production in Chelyabinsk Region in Postwar Years

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**Abstract**— This study examines the restoration and development of grain production in the Chelyabinsk region, data on the sizes of acreage and productivity of grain crops, as well as the structure of agricultural producers, dynamics of gross collecting throughout the studied period. The author applied various methods of processing the series of dynamics to study the gross yield used in agricultural statistics. The study also determines the role of the South Urals in the grain economy of the USSR in the post-war years. Fifteen post-war years are an important stage in the history of the USSR and the Chelyabinsk region. By the end of the Fourth Five-Year Plan, the agriculture of the region was restored at the pre-war level.

**Keywords:** Chelyabinsk region, postwar years, grain crops, collective farms, state farms, individual farms

## I. INTRODUCTION

National historiography reflects the state of agriculture of the USSR in the postwar years. We can find data on the state of agriculture, including grain, both in the country as a whole and in its individual regions, in the works of M.L. Bogdenko, I.M. Volkov, M.A. Vytsan, I.E. Zelenin, V.F. Zima and other authors [1; 3; 4; 6; 7; 8]. However in these studies there is little information about the state of agriculture in the Chelyabinsk region. It's given only in isolated cases, which is clearly not enough. Since the role of the South Urals in Russian history and its agricultural potential are very high.

Currently, the Chelyabinsk region is a historically formed industrial region that retains the status of a steadily developing agrarian entity. In 2015, the region took the 11th place among the constituent entities of the Russian Federation and the 1st place among the subjects of the Urals Federal District in terms of agricultural output. The share of the Chelyabinsk Region in agricultural products produced in Russia in value terms was 2.4%. There are different crops that are grown in the Chelyabinsk region: wheat (in 2015 – 19th place in the rating of Russian regions), barley (15th place), oats (12th place), buckwheat (11th place), rye ( 37th place), corn for grain (37th place), triticale (31st place) and millet (41st place). Wheat accounts for the largest share (46.1%) in the structure of the sown area of the region [49]. In 2017, according to the data of the Ministry of Agriculture of the Russian Federation, the grain harvest in the Chelyabinsk Region amounted to 23065 thousand centners

(1.7% of Russian production). The region took the twentieth place among the regions of Russia [2].

Grain farming in the region's agro-industrial complex plays a leading role. Therefore, such topics prompt the study of representatives of various sciences [16, 53, 54]. The role of grain farming in the Southern Urals was very noticeable in the middle of XX century. The share of grain and leguminous crops amounted to 86.9% in the structure of sown areas in the region in 1940, and 79.6% in 1950 (Table 1). Therefore, the work of historians devoted to the agriculture of the Southern Urals in certain historical periods is of considerable interest. Works by scholars such as M.N. Denisevich, V.N. Mamyachenkov, V.P. Motrevich, R.P. Tolmacheva, R.R. Khisamutdinova, explores different aspects of agricultural development in the Chelyabinsk region in the postwar years [5; 10; 11; 12; 14; 51; 52; 55; 56].

TABLE I. SOWN AREA OF GRAIN CROPS IN THE CHELYABINSK REGION (ALL CATEGORIES OF FARMS, THOUSAND HECTARES)

year	total crops	including cereal	crops						
			wheat	rye	barley	oats	millet	Buck wheat	Legu mes
1940	1507,7	1309,8	768,5	194,7	38,4	260,1	26,1	1,6	17,2
1946	977,4	778,3	340,5	152,2	27,6	221,5	12,5	4,7	15,7
1950	1360,6	1083,3	618,3	176,6	23,1	234,7	5,9	2,1	15,2
1960	2729,1	1863,6	1315,0	9,3	148,7	369,5	5,1	3,7	7,0

Source: [13, p. 109, 113; 17, p. 8; 43, l. 82]

## II. MATERIALS AND METHODS

The aim of the study is to analyze grain production in the Chelyabinsk region in the 1946-1960s, determine the role of various categories of farms in the grain economy of the region, and identify the contribution of the Southern Urals to the grain balance of the USSR. Various methods of processing time series used in agricultural statistics were used in the analysis of attracted and previously unpublished materials of the Russian State Archive of Economics and documents of the United State Archive of the Chelyabinsk Region.

### III. RESULTS AND DISCUSSION

On the eve of World War II, crops of grain crops occupied 1309.8 thousand hectares on the territory of the Chelyabinsk Region. The main cereal crop was wheat, mainly spring. Common crops were also oats, winter rye, barley, millet, buckwheat, and legumes (Table 1). The gross grain harvest in 1940 was equal to 8239.0 thousand centners, which amounted to 0.9% of the gross grain harvest in the USSR. Collective farms were the main suppliers of grain. On the eve of World War II, they accounted for 78.0% of the harvested grain (Table 2).

TABLE II. GROSS HARVEST OF GRAIN CROPS IN THE CHELYABINSK REGION IN 1940, 1945 - 1960, THOUSAND CENTNERS

Year	In total	including			% of the USSR
		collective farms	state farms	individual farms	
1940	8239	6429	1810	0	0,9
1945	5920	4064	1850	6	1,3
1946	4045	2870	1172	3	1,0
1947	5312	3801	1505	6	0,8
1948	4299	3269	1028	2	0,6
1949	5479	3927	1551	1	0,8
1950	14023	9431	4592	0	1,7
1951	11524	8512	3012	0	1,5
1952	8503	6397	2106	0	0,9
1953	18253	13343	4910	0	2,2
1954	15467	11341	4126	0	1,8
1955	8340	6135	2205	0	0,8
1956	25950	17311	8639	0	2,1
1957	10126	5375	4751	0	1,0
1958	12748	5767	6981	0	0,9
1959	25079	12102	12977	0	2,1
1960	22198	7877	14321	0	1,8

Source: [13, p.128, 130; 17, p. eight; 27, l. 74; 28, l. 65; 29, l. 99; 30, l. 102; 31, l.66; 32, l. 66; 33, l. 76; 34, l. 76; 35, l. 75; 36, l. 76; 37, l. 75; 38, l. 76; 39, l. 78; 40. L. 61; 41, l. 74; 42, l. 62; 43, l. 82].

The war caused enormous damage to the country's agriculture, including its rear areas. The number of rural population has decreased, the material and technical base of the industry has weakened noticeably. As a result, during the war years, grain crops in the region decreased from 1360.4 thousand hectares in 1941 to 782.8 thousand hectares in 1945, i.e., by 42.5%. Under wartime conditions, the yield of grain crops dropped sharply. So, in 1942, their yield on the collective farms of the region was 2.2 centners per hectare, in 1943 – 2.9 centners per hectare, on state farms, respectively, 2.5 and 3.0 centners per hectare [13, p. 113, 126]. A reduction in acreage and a drop in yields led to a significant decrease in grain harvest (Table 2).

After the end of the Second World War, the USSR began a rapid economic recovery. In agriculture, due to the mass demobilization from the army, the situation with personnel improved, the technical equipment of the industry gradually increased, many violations of the Charter of the agricultural artel were eliminated in the village. More

attention was paid to the situation in agriculture by the Party and Soviet bodies in the localities. So in June 1946 the issue of spring sowing was included on the agenda of the XIII Plenum of the Chelyabinsk Regional Committee of the CPSU (b). As a result, in 1946, for the first time in many years, the collective farms of the Chelyabinsk Region carried out the plan for spring sowing already in early June [51, p. 109]. However, the weather conditions of the first post-war year turned out to be extremely unfavorable for agriculture. The most important agricultural areas of the country were struck by a crop failure. As a result, in 1946, the grain harvest in the region decreased by a third compared with 1945 [28, p. 60; 30, l.103].

Other years of the fourth five-year plan were also unfavorable for farming. So, in 1948-1949. the summer was unusually hot and dry, and as a result, the number of pests began to grow. The year 1949 was marked by the massive spread of plant pests, there were not so many of them in the Southern Urals for a quarter of a century. Insects of the scoop family became widespread. Since 1948, there has been a tendency to increase locust pests. In 1949, the locust destroyed grain crops in the Minyar region [21, p. 4, 23]. A particularly high concentration of locusts was observed in the southern regions of the region, where in some places it completely destroyed the meadow vegetation. In a number of districts of the region – Kochkarsky, Troitsky, Chesmensky – there was a threat of a massive locust transition to spring grain crops. This was avoided only through the use of chemical warfare against them. To do this, around the crops created a protective strip with a width of 100 to 300 meters, which were scattered poison bait [21, l. 20]. Locust fought both manually and with the help of mounted sprayers. Aviation was widely used for locust control. In 1949, in the Chelyabinsk region, in the course of pest control, 11.7 thousand hectares of crops were processed, of which 11.5 thousand were treated with aviation [19, p. 39].

Crop failure in 1946 and the ensuing famine in the country demanded urgent measures to increase grain production. In this regard, much attention was paid to the restoration of grain farming at The February (1947) Plenum of the CPSU (b). It set the task for 1947-1949 by increasing the yield and expanding crops by the end of the five-year plan to significantly exceed the pre-war level of grain production [9, p. 103]. Local governments and administrations also showed activeness in solving the problems of agriculture. So in 1948 the secretary of the Chelyabinsk Regional Committee A.A. Beloborodov and the chairman of the Chelyabinsk regional executive committee, M.M. Bessonov appealed to the Council of Ministers of the USSR with a proposal "On measures to improve agriculture in the Chelyabinsk region". The leaders of the region asked to plant seeds for sowing, to increase credit assistance to collective farms, to write off debts, etc. [19, l. 35].

As a result of the measures taken by the end of the 1940s in the situation of agriculture there were serious improvements. First of all, the culture of agriculture gradually increased, more attention was paid to the work of variety testing sites. In 1949 varietal crops made 59,0% of grain, and in 1950 – 77,0%. In 1950, for the first time in the region, preparation for sowing with granular fertilizers was

carried out – a total of one thousand hectares were fertilized. In 1949, many farms and entire areas successfully fertilized winter crops with organic and mineral fertilizers. In the Kasli and Troitsk regions, the feeding of winter crops on an area of 1,300 hectares was carried out for the first time with the help of aviation. In the state farms of the region, they also sowed seeds for the first time with enriched seeds, in all farms on the eve of sowing, air-heat seed heating was produced [22, p. 390]. In 1948-1949 the USSR State Farm Ministry began to introduce a set of basic agrotechnical techniques. This complex included the introduction of grassland crop rotations, deep (by 20–22 cm) plowing, sowing of spring crops by plowing and winter crops in pairs, expansion of crops with varietal seeds, the use of organic and mineral fertilizers, snow retention, the use of chemical means for weed control, etc.

At the turn of the 1940s and 1950s in the Soviet Union, the creation of forest protection strips played a significant role in increasing yields. After the drought and famine of 1946-1947 in the USSR they began to take radical measures to improve the situation in agriculture. On October 20, 1948, the Council of Ministers of the USSR and the Central Committee of the CPSU (b) adopted a resolution “On the plan of forest shelter plantations, introduction of grassland crop rotations, construction of ponds and reservoirs to ensure high and stable yields in the steppe and forest-steppe regions of the European part of the USSR” [23, p. 273]. The measures outlined in the resolution in the press were called the Stalin Plan for the Transformation of Nature or the Great Plan for the Transformation of Nature. The purpose of this plan was to prevent droughts, sand and dust storms by building reservoirs, planting forest shelter plantations and introducing grassland crop rotations in the southern regions of the USSR. The main work on the implementation of the plan for the transformation of nature was carried out in the Urals in Bashkiria and in the aridest in the Orenburg region. Works on forest shelter vegetation and the creation of bands of local significance were also carried out in the southern regions of the Chelyabinsk region. In total, in those years, almost a third (29.1%) of collective farms of the region were engaged in them [57, p. 228 - 334]. As a result of the measures taken, the grain yield gradually began to increase, substantially exceeding the prewar level in 1950 (Table 3). At the same time, the acreage of grain crops was restored. In the Chelyabinsk region, they increased by more than a third, from 782.8 thousand hectares in 1945 to 1083.3 thousand hectares in 1950 [28, p. 65; 33, l. 76].

TABLE III. GRAIN YIELD IN THE CHELYABINSK REGION (ALL CATEGORIES OF FARMS, T / HA)

Year	All cereals	including						
		wheat	rye	barley	oats	mil let	buck wheat	legu mes
1940	6,3	8,0	6,0	4,9	6,4	3,7	3,8	4,3
1946	5,2	5,3	4,2	5,4	6,0	2,2	2,8	3,8
1950	12,9	14,1	7,8	12,3	14,6	4,2	6,7	8,2
1960	11,9	11,5	16,1	11,6	13,8	4,3	5,3	8,7

Source: [27, l. 74; 29, l. 99; 33, l. 76; 43, l. 82]

In 1949 there were changes in the order of remuneration of combiners. The earlier accrual system for combiners

wages did not stimulate the harvest of high-yielding grain. Now, production rates and prices were differentiated, a direct relationship was established between harvested grain yield, production rates and rates. Thus, if in the 1930-1940s labor of state farm combiners was estimated only by the number of hectares harvested, then at the end of the fourth five-year plan it was also evaluated by the number of threshed grain [6, p. 230, 264]. All of this was of great importance for increasing the gross harvest of grain. In the years 1950-1953 compared with the period 1946-1949 they have increased markedly.

The measures taken significantly improved the situation in agriculture and ensured the restoration of the industry in the first post-war years, but they did not solve the problems of Soviet agriculture as a whole. As a result, in the early 1950s in the country there was a decrease in the volume of agricultural production. Similar processes were typical for agriculture in the Chelyabinsk region. If in 1950 the value received in the field of agricultural products amounted to 186.1 million rubles (in prices of 1926/27), then in 1951 – 172.2 million, and in 1952 – 181.7 million rubles [33, l. 25, 25 ob.; 34, l. 14, 14 ob.; 35, l. 19, 19 ob.]. The reasons for the stagnation lay in the presence of many unsolved problems accumulated in the agriculture of the USSR during the 1930s-1940s. By the early 1950s, the advantages of the industry development associated with its recovery were exhausted. At the same time, the population of the Soviet Union increased, which required a serious improvement in the country's food balance.

In this situation, at the September (1953) plenum of the Central Committee of the CPSU, an agricultural recovery program was adopted, outlining a whole range of measures. It was pointed out that the harmful practice of overstating assignments for the advanced collective farms was unacceptable and it was found that within one district there should be one per-hectare supply rate. The order of planning and recording the implementation of tasks for the development of animal husbandry on January 1 of each year was canceled. To increase the material interest of the peasants in the development of the public economy, farmers were recommended to give the farmers in advance about 25.0% of the money received from the sale of livestock and animal products. The issuance of the specified cash advance to the collective farmers was proposed to be made quarterly. At the plenary session of the Central Committee of the CPSU, it was pointed out that it was necessary to completely end the harmful practice of infringing upon the interests of the population with regard to livestock that were in personal property. As a result, all the debts of previous years for mandatory deliveries of livestock products to the state by individual farms were written off; the collective farmers stopped attracting meat supplies to livestock [15, p. 36-38; 23, p. 48-53].

However, in the course of implementing the decisions of the September Plenum, the implementation of the “Great Plan for the Transformation of Nature” was abandoned. Instead, the actual head of the country N.S. Khrushchev put forward another plan to increase the production of grain crops: by dramatically expanding acreage through the development of virgin lands. Thus, in the second half of the 1950s one of the ways to solve the grain problem was the mass development of virgin and fallow lands, which began

by the decision of the February-March (1954) plenum of the Central Committee of the CPSU [9, p. 359-391]. In those years, in the eastern regions of the USSR, there were large unplowed land areas suitable for use in agriculture. In the Urals, virgin and fallow lands were in Bashkiria, Kurgan, Orenburg and Chelyabinsk regions. During the development of the virgin lands, the State Planning Committee of the USSR planned to plow 440.0 thousand hectares of new land in the Chelyabinsk Region. In fact, in 1954-1958s 890.0 thousand hectares of virgin lands were plowed [22, p. 390].

As a result, the recovery of the industry in the early postwar years and the development of virgin soil in the middle 1950s grain development in the Chelyabinsk region increased markedly. They increased from 778.3 thousand hectares in 1946 to 1083.3 thousand in 1950, 1271 thousand in 1953 and 1863.6 thousand hectares in 1960 [13, p.109, 113; 17, p. 8, 67; 43, p.82]. Particularly increased grain crops in the southern and southeastern regions of the region. So in the period from 1953 to 1960, crops of grain crops in the Bredinsky district increased from 42.8 to 179.8 thousand hectares. In the Varnensky district they increased from 72.5 to 149.8 thousand, in Kizilsky – from 103.9 to 194.3 thousand, in Oktyabrsky district – from 118.4 to 161.7 thousand, in Poltavsky – from 61.0 to 106.4 thousand, Troitsky – from 72.8 to 115.5 thousand, Chesmensky district – from 56.9 to 105.5 thousand hectares, etc. [17, p. 67].

Throughout the 1950s in the region, yields were gradually increasing. In some farms it was possible to get very high yields of grain for those times. So in 1956, the average yield of grain crops in the Krasnoye Znamya collective farm in Miassky district of the Chelyabinsk region was 21 centners per hectare, including spring wheat of 24 centners per hectare [50, p. 255]. In many ways, the yield depended on the quality of the seed. In the forest-steppe and steppe regions, spring wheat varieties such as “Iskra”, “Albidum 3700”, “Gordeiform 10”, “Saratovskaya-29”, etc. were zoned out. “Iskra” produced the highest yield of flour, its baking qualities were higher than average. The “Argayashskaya” buckwheat variety, the “Vyatka”, “Saratovskaya-1” and “Falenskaya” varieties of winter rye were also zoned. The main feed grain crop in the southern Urals was oats. In the region, the variety “Golden rain” was zoned, the more high-yielding variety “Eagle” replaced the variety “Pobeda” [50, p. 273, 277]. However, in general, in those years, the seed business in the Chelyabinsk region was abandoned, which was manifested in the absence of a systematic variety renewal and variety shift. The elite seed farms did not cope with the plans - orders for the elite and often grew elites that did not meet the standards. Seed-growing farms, for the most part, did not work satisfactorily, did not fulfill the requirements of agricultural engineering and received low yields, which led to a decrease in the quality of the grown seeds. Due to the lack of seeds of the required quality on collective and state farms, seeds of low sowing qualities were often used, which led to a significant decrease in yield. In 1955, 75.0% of grain crops were sown with seed varieties, in 1956 - 65.0%, in 1957 - 79.0%, and in 1958 - 72.0% [50, p. 258].

Thus, in the late 50s more than ¼ of grain crops in the Southern Urals were sown with off-grade seeds. As a result, throughout the 1950s it was not possible to achieve stable

grain yields in the Chelyabinsk region, their size is still largely determined by weather conditions. So, if in 1951 in all categories of farms, the yield of grain crops was 9.1 centners per hectare, in 1952 - 6.7 centners, in 1953 - 14.4 centners, in 1954 - 10, 7 centners, in 1955 - 5.0 centners, in 1956 - 14.6 centners, in 1957 - 5.9 centners, in 1958 - 5.8 centners, in 1959 - 14, 3ts and in 1960 - 11.9 centners per hectare [34, l. 76; 35, l. 75; 36, l. 76; 37, l. 75; 38, l. 76; 39, l. 78; 40, l. 614 41, l. 74, 42, l. 62; 43, l. 82].

The increase in acreage due to the development of virgin lands and the increase in yield significantly affected the gross grain harvest. After a poor harvest in 1955, 1956 turned out to be a record year. Compared to the previous year, the gross harvest of grain crops increased more than three times. For high achievements in the development of virgin and fallow lands, harvesting and fulfillment of obligations for the delivery of grain to the state, the Chelyabinsk region was awarded the Order of Lenin. The years 1959-1960 were also successful in agriculture, but the previous two years were low-yielding (Table 2). But if the crop failure in 1957 was a consequence of adverse weather conditions, then the 1958 harvest was affected by the consequences of the accident at the Mayak chemical plant in the Kyshtym district and the subsequent radioactive contamination of a large area in several districts of the Chelyabinsk region. As a result, in 1958, many agricultural enterprises moved from Bagaryak, Kasli and Kunashak districts to other districts of the region. On the basis of a decree of the Council of Ministers of the RSFSR, part of arable land in these areas was transferred to uncomfortable lands. In Kasli district alone, 5.5 thousand hectares were excluded from the taxable lands. For this reason, in 1958, for the Chelyabinsk Region, plans for the procurement and purchase of agricultural products were reduced, including grain by 53.0 thousand centners, potatoes by 9.0 thousand centners and vegetables by 3.0 thousand centners and etc. [18, l. 103, 152, 153].

At the turn of the 1950s-1960s the country's agriculture faced difficulties caused by a reduction in capital investment in the industry, as well as the reorganization of machine and tractor stations. Negative changes occurred in the structure of grain crops, in many areas, without taking into account regional peculiarities, they began to plant corn indiscriminately. The rapid expansion of maize crops, which affected the Southern Urals, was a characteristic feature of the development of agriculture in the USSR in the late 1950s and early 1960s. Advanced by N.S. Khrushchev in May 1957, the idea of overtaking the United States for the production of livestock products per capita marked the beginning of the voluntaristic "big leap" policy in the field of agriculture. One of its directions was “corn fever”. Corn began to grow even where it gave low yields of green mass. As a result, if in 1953 corn was not grown on the fields of the Chelyabinsk region, then in 1960 its crops occupied 192.2 thousand hectares [17, p. 59].

It should be noted that in those years in the virgin areas monoculture of spring wheat was introduced everywhere. So in 1960, wheat fields in the Bredinsky district were 162.5 thousand hectares (altogether in the region, grain crops occupied 179.8 thousand), in the Kizilsky region 156.8 thousand hectares of wheat were harvested (194.3 thousand hectares grain crops), in the Varnensky region under wheat

there were 112.6 thousand hectares (total grain crops in the region of 149.8 thousand). Total in 1960, the share of wheat in the region accounted for 87.0% of grain crops (17, p. 66, 67, 69). Thus, the requirements of agricultural engineering were violated, which led to a decrease in crop yields. As a result, after the harvests of the record for the South Urals in 1959-1960, in the first half of the 1960s in the region there was a decrease in the scale of grain production. In 1961 18168 thousand centners of grain were collected in the region, in 1962 – 19009 thousand, in 1963 – 16794 thousand, in 1964 – 18698 thousand, and in 1965 only 11002 thousand cent. [44, 1.74; 45. 1. 77; 46, 1. 78; 47, 1. 75; 48, 1. 84].

The materials of the Central Statistical Office of the USSR allow not only to investigate the dynamics of gross grain harvest, but also to determine the contribution of certain categories of farms to grain production. In the early postwar years, the main users of the land in the Chelyabinsk region were collective farms. According to the data for 1945, the area of arable land in the region was 2502.9 thousand hectares, while the collective farms accounted for 1611.3 thousand hectares. However, unlike the non-black-earth regions of the Urals, in the Chelyabinsk region the role of the public sector in agriculture was more significant [13, p. 36 - 38]. However, in the early postwar years, the decisive role in the collection of grain, as in the years of the Great Patriotic War, belonged to the collective farms. The share of other producers - state farms, subsidiary farms of industrial enterprises, organizations and institutions, individual farms of collective farmers, workers and employees, individual farmers during the fourth five-year plan averaged 29.7% (Table 4). In the 1950s In the course of the transformation of part of the collective farms into state farms and the organization of new virgin state farms, the number of Soviet farms increased markedly. If in 1953 there were 49 Soviet farms in the Chelyabinsk Region, in 1960 there were already 82 [17, p. 55]. As a result, the role of state farms in grain production has steadily increased. If in 1953 they accounted for 26.9% of the harvested grain, in 1956 - 33.3%, in 1958 - 54.8%, and in 1960 - 64.5%. [36, 1.76; 39, 1. 78; 41, 1. 74; 43, 1. 82]. As for the individual farms of the population, their role in grain production can be traced only in the first post-war years and averaged only 2.0% of the gross yield (Table 4).

TABLE IV. DYNAMICS OF GRAIN PRODUCTION IN THE CHELYABINSK REGION BY CATEGORIES OF FARMS (THOUS. C)

Category of farms	average per year		
	1946 - 1950	1951- 1955	1956 - 1960
Collective farms	4660	9146	9686
State farms	1970	3271	9534
individual farms	2	0	0
in all	6632	12417	19220

Source: [13, p.128, 130, 131; 17, p. 8; 27, 1. 74; 28, 1. 65; 29, 1. 99; 30, 1. 102; 31, 1.66; 32, 1. 66; 33, 1. 76; 34, 1. 76; 35, 1. 75; 36, 1. 76; 37, 1. 75; 38, 1. 76; 39, 1. 78; 40. L. 61; 41, 1. 74; 42, 1. 62; 43, 1. 82].

In the postwar years, the gross harvest of grain crops was subject to strong fluctuations, being constantly dependent on weather conditions. Therefore, to study the patterns of gross fees in agricultural statistics, various methods of processing time series are used. In particular, the method of averages is widely used. The data table 4 allows

us to calculate that in the Chelyabinsk region the average annual gross grain harvest in the years of the fourth five-year plan was 1.3 million centners. In the years of the fifth five-year plan, the average annual gross yield was 2.5 million centners, and in the years of the sixth five-year plan it was 3.8 million centners. Thus, the analysis of the dynamics of the gross fees for five-year cycles shows a steady increase in grain production throughout the study period.

Held in the 1950s changes in the organizational forms of agricultural producers, as well as annual fluctuations in grain yields, caused by weather conditions, make it difficult to identify the main patterns of their harvests. Therefore, to determine the dynamics of grain production, more reliable results are obtained using the moving average method. When using this method, the most severe fluctuations due to weather conditions are excluded. When using the moving average method, the actual data for several years is leveled by the influence of the characteristics of each year, resulting in a general trend. The accuracy of the average results obtained depends on the length of the oscillation period (Table 5).

TABLE V. AVERAGE MOVING GROSS GRAIN CHARGES IN THE CHELYABINSK REGION IN 1946-1960, THOUSAND CENTNERS

Five-year periods		Ten-year periods	
years	average gross yield	years	average gross yield
1946 – 1950	6632	1946 – 1955	101165
1947 – 1951	8127	1947 - 1956	117150
1948 – 1952	8766	1948 - 1957	121964
1949 – 1953	11556	1949 - 1958	130413
1950 – 1954	13554	1950 - 1959	150013
1951 – 1955	12417	1951- 1960	158188
1952 – 1956	15303		
1953 – 1957	15627		
1954 – 1958	14526		
1955 – 1959	16449		
1956 – 1960	19220		

Source: [13, p.128; 17, p. eight; 27, 1. 74; 28, 1. 65; 29, 1. 99; 30, 1. 102; 31, 1.66; 32, 1. 66; 33, 1. 76; 34, 1. 76; 35, 1. 75; 36, 1. 76; 37, 1. 75; 38, 1. 76; 39, 1. 78; 40. L. 61; 41, 1. 74; 42, 1. 62; 43, 1. 82].

The analysis carried out according to table 5 shows that the moving average for five years shows an increase in the grain yield in the first post-war years. Then follow 1951–1955 and 1954–1958, which gives grounds to believe that the trend of growth of grain yields has been broken. However, calculations on the moving average over decades prove the opposite. The data obtained over ten-year periods indicate that the growth of gross grain harvest, although with varying degrees of intensity, occurred in the Chelyabinsk region throughout the entire period under study.

The methods of agricultural statistics make it possible to investigate not only the dynamics of the gross grain harvest, but also the influence of various factors on them. The change in acreage is a quantitative factor. The change in the gross yield due to this factor is determined by multiplying the increase (decrease) in the crops for the compared periods by the yield level of the base year according to the formula  $(S_1 - S_0) \cdot Y_0$ . The change in gross yield due to changes in yield (also a quantitative factor) is determined by multiplying the magnitude of the change in yield by the size of the sown area of the reporting year using the formula

$(Y_1 - Y_0) \cdot S_1$ . The data of tables 1, 2, 3 indicate that in 1946 in the Chelyabinsk region with 778.3 thousand hectares of sowing of grain crops collected 4,045.0 thousand centners of grain with an average yield of 5.2 centners per hectare. In 1960, these figures were, respectively, 1,863.6 thousand hectares, 22,198.0 thousand centners and 11.9 centners/ha. The calculations show that in the postwar years, the increase in grain harvest due to changes in the size of crops was  $(1863.6 - 778.3) + 5.2 = 5643.6$  thousand centners. Due to the increase in yield, the increase in production amounted to:  $(11.9 - 5.2) + 1863.6 = 12486.1$  thousand centners. The influence of these factors can be expressed in relative terms [58]. Calculations show that in the general increase in the gross grain harvest, the increase due to the increase in yield was 68.9%. This means that in the post-war years in the Chelyabinsk Region, despite the development of virgin lands, intensive factors dominated the increase in grain production.

#### IV. CONCLUSION

Fifteen post-war years are an important stage in the history of the USSR and the Chelyabinsk region. By the end of the Fourth Five-Year Plan, the agriculture of the region was restored at the pre-war level. The most important event of the second half of the 1950s was the development of virgin lands, which was a major step in increasing grain production in the Southern Urals. However, despite the development of virgin lands, intensive factors prevailed in the increase in grain production in the region. The main cultivated cereal was spring wheat. As a result of the development of virgin lands, its share in grain crops has increased even more. Oats occupied an important role in grain farming, in the post-war years barley crops increased markedly. As for winter rye crops, they have decreased by more than 20 times during the study period. Up until 1958, most of the grain crops in the region were raised by collective farms. In the second half of the 1950s the transformation of part of the collective farms into Soviet farms, the creation of new virgin state farms led to a significant increase in the role of state farms in grain production. A characteristic feature of the development of agriculture in the Chelyabinsk region in the 1950s steel high growth of grain production. The grain farming of non-chernozem regions of the Urals developed much more slowly. The data presented in the work indicate that in the postwar years, especially in the second half of the 1950s, the Chelyabinsk region was an important breadbasket of the country. For the years 1946-1960s 191.3 million centners of grain were harvested in its fields, which amounted to 1.4% of the all-Union grain harvest for those years.

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