

PRODUCTION OF SOME TECHNICAL CULTURES IN THE TERRITORY OF THE VOLGA FEDERAL DISTRICT

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Abstract: The article discusses the placement and production of industrial crops on the territory of the Volga Federal District (PFD), which is located in several natural zones and is distinguished by some climatic and agroecological conditions for the cultivation of these plants associated with the peculiarities of natural conditions: the amount of heat, light, moisture and physical and chemical composition of the soil. The location and production of industrial crops, in addition to the geographical location of the Volga Federal District, is also affected by agro-climatic and economic factors. We consider in more detail the production of industrial crops from 2005-2018 in the Volga Federal District and their relations with manufacturing enterprises - light, pharmaceutical and food.

Key words: geography, crop production, industrial crops, cultivation features, production, Volga Federal District.

1 Introduction

Industrial crops are a large group of plants grown in agriculture to produce particularly valuable products: sugar, vegetable oil, industrial oils, fibers, aromatic and medicinal substances, and therefore in the literature such crops are called technical. By geographical location, the territory of the Volga Federal District is located in several natural zones: the right bank of the district is occupied by the forest-steppe, where gray podzolized soils predominate in the north, black earth in the south, and dark chestnut soils and ordinary black soils are mainly characteristic of the natural zone of the okrug steppe. In the agricultural structure of the Volga Federal District, industrial crops occupy small sown areas in comparison with grain crops. The production of industrial crops on the territory of the Volga Federal District also has some climatic and agroecological

peculiarities of their cultivation, associated with more stringent requirements for agro-climatic conditions: the amount of heat, light, moisture and the physical and chemical composition of the soil, etc (Lobin, 2007; Kolodina, 2006; <https://www.gks.ru>; Khrushchev, 2001). The main industrial crops cultivated in the territory of the Volga Federal District are: sugar beets, sunflowers, flax, hemp, etc. The inclusion of industrial crops in the crop rotation of individual farms in the district contributes to increasing the yield of crops, and also requires the maintenance of row spacing of some industrial crops, particularly sugar beet in the loose and clean of weeds. Production of industrial crops in the Volga Federal District is more closely related to the location of enterprises in the light, pharmaceutical, and food industries. From industrial crops at the enterprises of these industries produce: vegetable oil, sugar, molasses, medicines and various products of light industry, etc.

The purpose of the study: to study some features of the production of industrial crops in the Volga Federal District, depending on the climatic and agroecological conditions.

2 Materials and Research Methods

Theoretical analysis of economic-geographical and cartographic literature, statistical data and systematization of the collected materials on the studied problem. The work also uses data characterizing the physical and economic-geographical and some agroecological features of the production of industrial crops for individual subjects of the Volga Federal District.

3 Research Results and Discussion

The production of industrial crops on the territory of the Volga Federal District, unlike the production of grain crops, is due to limited areas of their distribution and some features, such as climatic, agroecological, economic (labor, capital intensity), etc. Therefore, the production of each industrial crop depends on the availability of favorable agroclimatic conditions. On the territory of the district, the most common industrial crops are: sugar beets, sunflowers, flax, hemp, etc.

Natural and climatic and agroecological conditions of a significant part of the territory of the Volga Federal District make it possible to cultivate sugar beets. For its cultivation, sufficient heat must be present, well-warmed and nutrient-rich soils, characterized by high moisture capacity and a neutral reaction. Sugar beets grow best in the forest-steppe zone and in the northern part of the steppe zone of the district, where the above conditions are combined. Good results when cultivating sugar beets can only be achieved with a high crop culture and observing crop rotation rules in all fields. The subjects of the Volga Federal District involved in the production of sugar beets are presented in table 1.

Table 1: Gross harvest of sugar beets in the republics and regions of the Volga Federal District (thousand tons) (Khrushchev, 2001)

Subject Name	2005	2008	2011	2015	2018
Republic of Bashkortostan	1175,8	1108,9	1419,3	1290,1	1426,2
The Republic of Mordovia	295,5	446,4	856,8	909,6	621,3
Republic of Tatarstan	2038,3	1826,8	1936,0	2011,0	2109,1
Chuvash Republic	97,1	34,7	32,9	26,5	-
Nizhny Novgorod Region	323,7	259,3	247,9	209,8	300,6
Orenburg region	0,3	0,1	7,2	22,3	-
Penza region	678,4	1091,2	2053,5	1517,4	1834,3
Samara Region	55,3	-	8,9	-	-
Saratov region	181,4	188,9	237,8	236,9	341,3
Ulyanovsk region	210,5	270,8	551,6	403,7	274,0
Total Federal District	5055,3	5227,1	7352,5	6628,0	6947,4

As can be seen from the table. 1 the gross yield of sugar beets in the Volga Federal District in 2018 increased by 1892.1 thousand tons compared to 2005. The gross yield of sugar beets in the constituent entities is different, so in the Penza region production increased over these years by 1155.9 thousand tons., in the Republic of Mordovia by -335.8 thousand tons, in the Republic of Bashkortostan by -250.4 thousand tons, in the Republic of Tatarstan by 70.8 thousand tons, in the Ulyanovsk region by -63.5 thousand tons, in the Saratov region by 59.7 thousand tons, and in the Nizhny Novgorod region, on the contrary, the gross yield of sugar beets decreased by 23.1 thousand tons, in the Republic of Chuvashia and Samara and Orenburg areas dropped completely. Due to unfavorable agroclimatic conditions, sugar beets are practically not cultivated in the Udmurt Republic, in the Perm Territory and in the Kirov Region. The average yield

of sugar beets in the district in 2005 from one hectare was 240 c., In 2008 - 285 c., In 2011 - 288 c., In 2015 - 311 c. and in 2018 - 312 centners and there was a positive trend (Khrushchev, 2001; <https://en.wikipedia.org>).

The second most important technical crop in the Volga Federal District is sunflower. Sunflower is a crop demanding on soil fertility, heat and light, but less moisture, as it has a well-developed root system and thanks to it extracts moisture from the deep layers of the soil horizon and therefore it is mainly grown in the eastern part of the forest-steppe and southern steppe regions of the county (Lobin, 2007). Sunflower is sown and harvested a little later than the bulk of crops. The republics and regions where sunflower is grown are presented in table 2.

Table 2: Gross harvest of sunflower seeds by subjects of the Volga Federal District (thousand tons) (Khrushchev, 2001)

Subject Name	2005	2008	2011	2015	2018
Republic of Bashkortostan	125,7	137,1	254,4	241,9	324,4
The Republic of Mordovia	2,1	0,9	2,7	2,1	3,4
Republic of Tatarstan	3,2	3,0	28,8	58,3	191,4
Chuvash Republic	-	-	0,1	3,2	4,5
Nizhny Novgorod Region	-	13,0	10,0	-	10,7
Orenburg region	269,5	425,8	589,2	530,3	959,7
Penza region	41,1	46,3	188,9	261,9	389,7
Samara Region	248,5	304,7	543,0	537,2	965,7
Saratov region	527,1	659,0	1217,7	1005,4	1573,5
Ulyanovsk region	33,5	54,1	138,4	173,2	278,0
Total Federal District	1250,6	1643,9	2973,3	2813,5	4701,3

As can be seen from table 2, sunflower in the Volga Federal District is grown in 10 subjects, the largest producers of sunflower seeds are Saratov, Orenburg, Samara, Penza, Ulyanovsk regions and the Republic of Bashkortostan. In the Volga Federal District, sunflower production increased in 2018 compared to 2005 by -3450.7 centners. The first place for the production of sunflower seeds in the district is the Saratov Region, where the difference in 2018 compared to 2005 is 1046.4 thousand tons, then in the Samara Region -717.2 thousand tons, in the Orenburg Region -690, 2 thousand tons. The average yield of sunflower per district per hectare is: in 2005 -8.8 c., 2008 -9.3 c., In 2011 -9.8 c., 2015 -10.6 c., in 2018 -13.4 centners, thus there is a positive yield dynamics (Khrushchev, 2001; <https://en.wikipedia.org>).

The most important technical culture in the northern regions of the Volga Federal District is flax flax. Flax requires coolness,

usually in cloudy weather, is very hygrophilous and does not tolerate heat, and it is advisable to have crops that enrich the soil with nitrogen as precursors of flax. Flax flax is susceptible to fungal diseases, which reduces the quality of plant fibers, because of this it can be sown on one field no more than once every seven to eight years. Flax is a cold-resistant crop, and it is sown in the first half of May in some areas of the Nizhny Novgorod and Kirov regions and in the Udmurt Republic, Tatarstan on loamy and sandy loamy soils with abundant moisture, as it requires fertile and completely weed-free lands (Lobin, 2007; <https://www.gks.ru>)

Thus, in the Volga Federal District, the republics of Mari-El, Tatarstan, Udmurtia and the Kirov and Nizhny Novgorod Regions are involved in the production of flax fiber, since these regions have favorable soil and climatic conditions for the cultivation of flax fiber (see Table 3).

Table 3: Gross harvest of flax fiber by subjects of the Volga Federal District (thousand tons) (Khrushchev, 2001)

Subject Name	2005	2008	2011	2015	2017
Mari El Republic	1,2	0,4	0,1	-	-
Republic of Tatarstan	0,6	0,8	0,9	1,4	1,5
Udmurt republic	6,7	5,9	4,4	3,6	4,5
Kirov region	1,0	0,4	0,3	-	-
Nizhny Novgorod Region	1,4	1,0	2,9	2,1	2,3
Penza region	-	-	0,6	-	-
Total Federal District	11,0	8,4	9,1	7,3	8,3

As can be seen from table 3, flax flax is not grown in all subjects of the Volga Federal District, the largest number of them is produced in the republics of Udmurtia, Tatarstan and in the Nizhny Novgorod region. In Udmurtia, the main flax-growing areas are Kotelnichesky, Shabalinsky, Svechinsky, Darovsky, Tuzhinsky, where there are flax processing enterprises. So, flax crops in Tatarstan in 2007 amounted to 1.1 thousand hectares and the gross harvest amounted to 0.82 thousand tons, and the yield of flax fiber was 7.2 centners per hectare, and in 2015 the

average yield was -13, 3 c. (Kolsanov et al., 2009; Khrushchev, 2001), and in the Nizhny Novgorod region this indicator was 14.3 centners. In some areas of the Orenburg region, flax curls are grown (Trifonova, 2011).

4 Summary

As you know, flax belongs to the technical spinning culture from which fiber is made for the textile industry. Fiber is obtained

from the stalks of flax, yarn is spun, and fabrics are woven. Clothing made from linen fabrics is very popular among the population. Flaxseed has healing properties and it helps with inflammation of the human body, oil is also made from its seeds, which is eaten. But most often varnishes and paints are made from linseed oil, and they are also used to make waterproof fabrics, and the cake obtained as a result of flax processing is used in animal husbandry as feed for cattle breeding, and chaff in pig breeding.

In the Republic of Mordovia, the Ulyanovsk and Penza Regions, technical hemp is grown in small volumes. It is grown on fertile and well-moistened alluvial soils of river valleys, especially along the river valley. Surah and Barysha. Technical hemp is used in construction, in the automotive, fuel, light and paper industries.

5 Conclusions

The territory of the Volga Federal District is located in several natural zones and differs in some natural climatic and agroecological conditions for the cultivation of these plants associated with the peculiarities of natural conditions: in terms of the amount of heat, light, moisture, and the physical and chemical composition of the soil. Therefore, the territory of the district is favorable for the cultivation of the following industrial crops, such as sugar beets, flax, sunflower, hemp. The analysis of their sown areas shows that they occupy small territories in the structure of agriculture in the subjects of the Volga Federal District. The conditions for the production of sugar beets, sunflowers and long flax in the republics and regions are described in more detail, depending on their geographical location within the okrug. The location and production of industrial crops, in addition to the geographical position, is also affected by agro-climatic and economic factors. The production of industrial crops in the subjects of the Volga Federal District from 2005-2018 and their relationship with manufacturing enterprises - food, light and pharmaceuticals are examined in more detail.

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