

METHODOLOGICAL ASPECTS OF SYSTEM AND HIERARCHAL ANALYSIS OF THE OILSEEDS SUB-COMPLEX OF THE REGIONAL AGRO-INDUSTRIAL COMPLEX: RISKS AND PRODUCTION AND TECHNOLOGICAL SPECIFICITY

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Abstract: *The problems related to developing the oilseeds sub-complex in the structure of the crop sector of agriculture require due provision with adequate analytical tools. A great number of factors and conditions of various etiology and level localization have an impact on the economic efficiency of producing oil crops. The article aims at analyzing the aggregate conditions of the production in the oilseeds sub-complex of the regional agro-industrial complex in terms of searching for reserves to increase its economic efficiency. The research formed the methodological provisions. They reflect analytical peculiarities and specificity of applying the algorithmic methodological approach on carrying out the system and hierarchal analysis. This approach was developed for a comprehensive research of the sub-complex under consideration. The results of the practical approbation of the offered methodological approach allowed to reveal the necessity to minimize the dependence on climatic factors and need to promptly decrease the expenses of agricultural producers. The results of the conducted researches showed that taking into account the revealed determinants of the oilseeds sub-complex development, perspectives of its development under hard market and natural conditions lied in using the no-till technology. It decreases operational expenses in the volatile price environment of the oilseeds markets of various levels. The authors made a searching and heuristic attempt to improve the methodological provision for analytical researches of processes related to functioning and developing mono-product sub-complexes in the crop area of agriculture, and to develop unified approaches to implementing empiric research procedures.*

Keywords: *Agrarian economy, oilseeds sub-complex, system and hierarchal analysis, risk management, increase in the economic efficiency.*

1. INTRODUCTION

The multi-directionality of vectors and dynamics of developing various areas and sub-areas of the agrarian sector of the Russian economy (that also underwent the 2014 events related to introducing economic sanctions against Russia and responded with counter measures for the purpose of import substitution and protection of

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national markets) stipulates the necessity to study the details and to analyze the state of the agricultural areas. One of the characteristic peculiarities is related to the oilseeds sub-complex that is the most important in terms of providing the availability of the balanced feeding. It lies in the fact that within this sub-complex, it is necessary to consider agricultural crops that, on the one hand, are combined in one group according to the primary processing product (oil) obtained from them, and, on the other hand, unlike, for example, cereal crops, are characterized by various agronomic characteristics, peculiarities of growing and selling, and other specific features.

Unlike the cereals market that is characterized by relatively stable economic parameters and acceptable level of their volatility, the market of oilseeds crops is more inhomogeneous, and requires more detailed study and system and hierarchal analysis. Based on this, revealing, analysis and economic interpretation of determinants of the oilseeds sub-complex will allow to define goosenecks that characterize the process of its functioning, determine characteristic tendencies taking into account the disturbing impact of factors and conditions of various levels of impact and etiology, aggregate of risks and advantages that are peculiar of the mono-product sub-complex under research. Besides, defining and analyzing determinants will be used as informational basis for revealing and monitoring of stress and negative elements of the factorial and environment area that cause dynamic changes in the development of the oilseeds production of every economic level.

The authors specify that at the present time there is an apparent conceptual and methodological, and practice-focused task. It is related to improving the methodology of the system and hierarchal analysis for the oilseeds sub-complex of the regional agro-industrial complex for the purpose of detailing and concretizing risks and revealing the production and technological specificity taking into account the transformation of the aggregate of the market and natural environment factors.

2. METHODOLOGY

2.1. General Provisions of the Methodological Approach

The authors formed general provisions of methodological basis of the research taking into account specially prepared theoretical and conceptual fundamentals. They were made up by scientific works of Russian and foreign researches in the area of developing agrarian relations, theoretical and methodological recommendations of research institutions on issues related to agricultural areas functioning and researching, and legislative and statutory acts of the Russian Federation on the development of the agrarian sector of economy. The methodological basis of the research is represented by a complex of fundamental methods of the scientific cognition: analysis, synthesis, dialectic integrity of qualitative and quantitative

estimation, system and hierarchical approaches, induction and deduction. In the process of stipulating theoretical provisions, regularities and determinants of the development of the sub-complex under research, conclusions and recommendations, various tools and methods were used, including the abstract and logical, monographic, calculation and constitutive, economic and statistical methods, methods of system and comparative analysis, analytical, graphic, etc.

The informational and empiric basis is represented by the data of the Federal Service of State Statistics of the Russian Federation, the territorial body of the Federal Service of State Statistics in the Stavropol Territory, data of the expeditionary and forms sociological studies, scientific resources, information of periodicals, expert estimations, and results of the authors' calculations.

The analysis and accounting of the scientific heritage of the recent researches [El'chaninova O. V., Tatarinova M.N., Grishanova S. V., Germanova V. S., Debeliy R. V. (2014), Gerasimov A.N., Gromov E.I., Gulay T.A., (2015), Taranova I.V., Gunko A.U., Alekseeva O.A., Bunchikov O.N., Kurennaya V.V. (2015), Truhachev V.I., Kurennaya V.V., (2015), Zaitsev V.K., Kurennaya V.V. (2013), Trukhachev V.I., Kostyukova E. I., Gromov E. I., Gerasimov A.N. (2014), Trukhachev V., Ivolga A., Lescheva M. (2015), Tomilina, E.P., I.I. Glotova and I.P. Kuzmenko (2013), Aldashev, G., Limardi, M., Verdier, T. (2015), Hanson G. (2005), Head K., and T.Mayer. (2004), Harry Garretsen, Ron Martin (2010), Bobryshev, A. (2015)] on the problems related to the development of agriculture in the agro-socio-economic environment showed that problems aspects were basically stipulated and related to the system-wide problems of developing the agrarian sector of economy. Scientific researches on a number of adjacent problems show general complicating of the conditions related to mono-product sub-complexes functioning, stable escalation of the world phenomena of the economic turbulence, the need to search for scientific and methodological tools on revealing the reserves to improve the economic efficiency of production and commercial processes taking into account the complicating impact of a set of factors of the market and nature agro-socio-economic environment.

It allowed to form the algorithmic procedure to conduct the researches.

2.2. Algorithm of the Research (Methodology of the System and Hierarchical Analysis)

During the research the authors formed the methodology of the system and hierarchical analysis of the oilseeds sub-complex of the regional agro-industrial complex.

At the first stage the impact of the world-wide tendencies was estimated. After the analysis of the most considerable external strategic factors that have an impact of the oilseeds sub-complex functioning, they were grouped by using the methodology of the EFAS analysis. The EFAS form is made up on the basis of the results of the

analysis of the sector (enterprise) readiness to react to changes of the external strategic factors of the macro-environment. Herewith, every factor is estimated in accordance with the level of importance for the enterprise or area under analysis. For the purpose of improving the informativeness during the analysis, the vector of every factor impact – positive or negative – is defined. The EFAS form is made subject to complying with the following stages:

1. Basic (the most considerable and peculiar) factors that have an impact on the state of the area/enterprise are defined by expertise. Herewith, an expert estimation is given to the vector of every factor impact: positive or negative.
2. The revealed factors are estimated by the weighted index from 0 (zero value) to 1 (maximum value) on the basis of the expert estimation of the probable impact of every factor on the strategic position of the area (enterprise). In accordance with the methodology, in total the weighted indexes are equal to 1.
3. Then every factor is estimated according to the 5-rating scale: 1 – minimum value, 2 – below average, 3 – average value, 4 – above average, and 5 – maximum value. The estimation of factors is differentiated according to the level of the area reaction to this factor.
4. The weighted estimate of every factor is calculated by multiplying its value to the estimation.
5. At the final stage the total weighted estimate for the area (enterprise) under analysis is calculated. The total indicator of the weighted estimate of all factors provides relevant information that objectively shows the state and perspectives of the development of the area (enterprise) under research.

According to the results of implementing the first stage, we formed system determinants of the oilseeds sub-complex functioning taking into account the impact of external factors of the strategic nature.

At the second stage, meso-level tendencies in the dialectical integrity of production and commercial aspects are analyzed. It gives the following analytical blocks:

- Analysis of the peculiarities of the agro-nature-economic environment of the oilseeds sub-complex functioning,
- Estimation of the zone differentiation of productive forces of the oilseeds sub-complex of the region under research, and
- Analysis of the market environment.

At the third stage the comparative analysis of the efficiency of technological approaches on the micro-level was carried out. It allowed to move to formulating practical system recommendations.

3. RESULTS

3.1. Worldwide Tendencies. Estimation According to the EFAS Mythology

On the basis of the expert estimations obtained as a result of polling the specialists involved in manufacturing oilseeds products, the most important factors that define the state and dynamic of basic tendencies of the oil market (production of vegetable oils) were determined and systemized (Table 1).

Table 1
EFAS Form for the World Market of Oils

<i>S.No.</i>	<i>Factor</i>	<i>Factor value</i>	<i>Factor estimation</i>	<i>Weighted estimate</i>
<i>Positive impact</i>				
1	Price environment	0.1	4	0.4
2	Peculiarities of producing vegetable oils	0.15	2	0.3
3	Consumer's preferences	0.05	2	0.1
4	Quality standardization	0.05	2	0.1
5	Customs regulation of export and import operations	0.05	2	0.1
<i>Negative impact</i>				
6	General economic state of Russia	0.1	3	0.3
7	Climate conditions	0.2	4	0.8
8	Dynamics of Russian agriculture	0.2	3	0.6
9	Level of population's profits	0.1	3	0.3
Total		1.0	-	3.0

The obtained total value of the weighted estimate says about a rather high level of passivity on the market of vegetable oils and a low degree of reaction on the part of producers in this area. It means that the Russian market of vegetable oils production is rather heavy and passive according to the reactions to the external environment changes. It is proved in the process of analyzing and comparing the share of products that are exported and made for the internal consumption in the countries that are leaders in producing sunflower oil: Russia, Ukraine, and Argentina (Figure 1).

The Russian market of oil products, particularly sunflower oil, has an oligopolistic type of organization with the vividly expressed strive of large companies for forming vertically and horizontally integrated structures. Herewith, the structures that produce sunflower oil are focused above all on the internal market. It causes the peculiarities that are quantitatively expressed during the EFAS analysis.

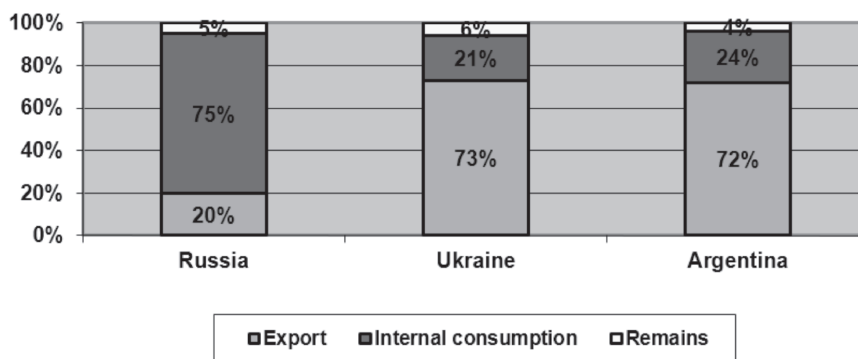


Figure 1: Structure of Allocating Total Supply of Oil in Average for the Period under Research (According to the US Department of Agriculture)

3.2. Determinants of Functioning of the Oilseeds Sub-complex Taking into Account the Impact of External Strategic Factors

According to the results of analyzing and estimating the state of the micro-environment of the oil products market, it is necessary to single out the vivid determinants of the oilseeds sub-complex functioning taking into account the impact of external strategic factors:

1. At the present moment the external macro-environment of the oilseeds sub-complex in Russia is represented by a relatively small number of facts that have a considerable impact on functioning of the area enterprises. It is stipulated by the priority of meeting internal needs in oil products as compared to the priority related to exporting products in the leading countries according to the production volumes – Ukraine and Argentina.
2. The factors that have the greatest impact on the stability of the oilseeds sub-complex structures are not distinct in a high degree of changeability. However, they are characterized by rather stable tendencies: positive vector – price environment for the oil products, negative – change of climate conditions stipulated by the climate warming.
3. External factors that have the greatest impact on the sub-complex functioning include climate conditions (they are especially urgent for rape) and dynamics of the price environment. The first factor is peculiar of the fact that it is almost not eliminated. It considerably increases the importance of forming a system of risk management by using insurance tools, complying with agro-technical requirements, and applying progressive ways to grow crops. On the contrary, the second factor can be fundamentally and technically analyzed. It gives specific strategic and tactical advantages to those who carry out and use marketing researches. In terms of the “climate conditions” factor, it is also necessary to note the maximum value of the weighted estimate – 0.8. It proves the urgency

to make up a production risks management system and importance of the technological processes evolution.

4. The minimum values of the weighted estimate – 0.1 – are found with such factors as “The customer’s preferences”, “Quality standardization” and “Customs regulation of export and import operations”. It is explained by the oligopolistic type of the competence on the Russian oil market, similarity of goods characteristics and consumer qualities of oil products whose greatest share belongs to the sunflower oil, as well as a rather high degree of indifference of end buyers of products – population. The majority of them buy vegetable oils not on the basis of their personal tastes or preferences, but directly to meet the need in the product itself. The customs regulation of export and import operations does not have a considerable impact on the majority of the sub-complex structures, because they mainly serve the internal market and produce the greatest share of their products for it. Under conditions of trade sanctions and tasks on the import substitution set by the state, the low impact of this factor must be estimated positively.
5. It is necessary to note that to a great degree the Russian market of the oil products (vegetable oils) disharmonizes with oil markets of other leading countries such as Argentina and Ukraine. The priority of internal consumption over the export is a peculiarity that is stipulated, to a great degree, by climate characteristics, the level of profits, and taste preferences of the population. It forms a sort of restraint on the internal market by attracting import products of a more expensive segment that include olive, flaxseed, soya, and rape oils.
6. Other specific and general problems (risks) that members of the oil market face also have an impact on the processes of the oilseeds sub-complex functioning and developing. The majority of the sectoral risks have the system nature:
 - Low efficiency of state regulation,
 - Obsolescence and insufficiency of the material and technical basis - about 60% of companies that are not market leaders have obsolescent equipment meant for simple processing of raw materials,
 - Weak development of the institutional basis for the development of the competitive environment. It prevents the inflow of the private capital in the area,
 - Worsening ecological state in the regions where oil crops are grown,
 - Decrease in the yield of basic oil crops used for producing vegetable oil,
 - Appreciation of the processing equipment required to produce, store and transport vegetable oil,

- Growth of prices for fuel and power resources together with the obsolescent equipment and basic assets with high power consumption when producing vegetable oil. They considerably surpass this indicator for the modern equipment of foreign companies. It causes the growth of the prime cost of oil, and
- Growing level of the world prices for basic oil crops that leads to the increase in the volumes of export of unprocessed products from Russia and reduction of raw materials resources for internal processors.

Thus, the analysis of factors of the sectorial risk shows that the oilseeds sub-complex must be estimated as highly risked with the potential of high efficiency at various stages of forming the value added.

3.3. Analysis of the Meso-level Tendencies: Dialectics of Production and Commercial Aspects

3.3.1 *Analyzing Peculiarities of the Agricultural, Natural and Economic Environment of the Oilseeds Sub-complex Functioning*

Studying natural peculiarities and factors that have an impact on the processes and results of the research object functioning is an important stage of the comprehensive analysis of the oilseeds sub-complex operation. The location and natural peculiarities of the Stavropol Territory to a great degree define both positive and negative parameters of production processes in its agrarian sector. The Stavropol Territory is one of the developed agrarian regions of the country. Here winter and spring cereals, hoed and industrial vegetables are grown. Fruit growing, cattle breeding, and agricultural products processing are developed here.

The crop area of the Stavropol Territory is characterized by a high degree of specializing in cereals production. In total these are cereals that form the greatest share of incomes from the agricultural production in the Territory. Figure 2 shows the situation related to the dynamics of cultivated areas of oil crops in the Stavropol Territory.

For the period of 2009-2013 the correlation of the cultivated areas for oil crops considerably changed. In 2013 as compared to 2009 the cultivated areas for oil crops increased by 23.9% as compared to the 2009 figures. These changes were not occasional. One of the reasons was the situation when agricultural producers did not have enough working assets and possibility to get cheap long-term loans and expanded the production of mainly sunflower that provided higher indicators of efficiency.

Comparing the dynamics of the cultivated areas for oil crops with the total cultivated areas (Figure 3), it is necessary to note the advance of the tempos related to the growth of cultivated areas for oil crops: the tempo of growth was 123.9% as compared to the decrease in other cultivated areas by 0.8%.

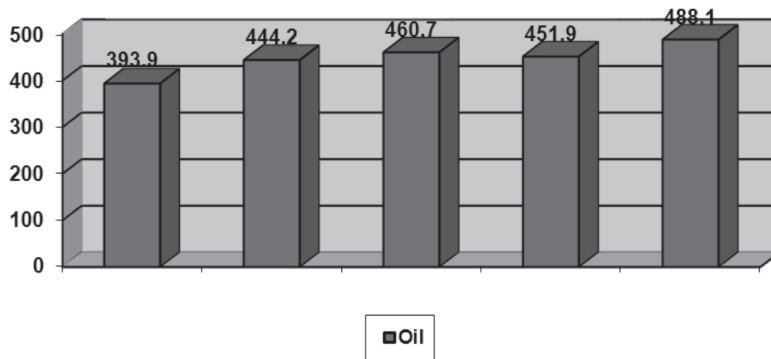


Figure 2: Cultivated Areas of Oil Crops in the Stavropol Territory for 2009-2013, thous. ha

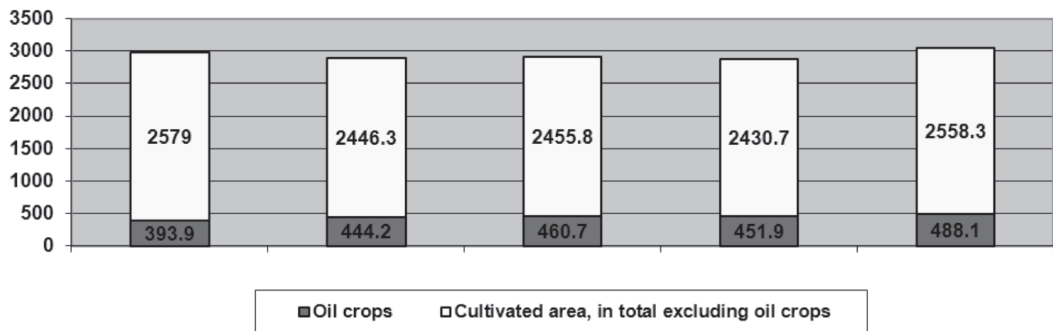


Figure 3: Comparative Dynamics of Cultivated Areas in the Stavropol Territory for 2009-2013, thous. ha

The cultivated areas meant for oil crops increased both absolutely and structurally. It can be partially explained by the rotation of sunflower in the cropping system and positive dynamics of the market environment (Figure 4).

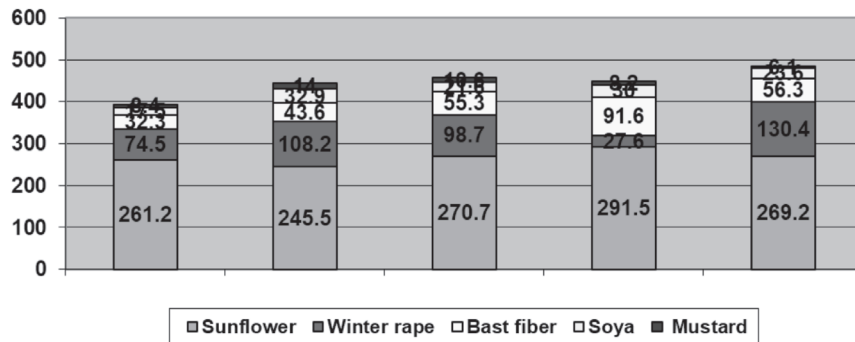


Figure 4: Correlation of Oil Crops in Cultivated Areas in the Stavropol Territory for 2009-2013, thous. ha

It is reasonable to compare the dynamics of gross collection of oil crops with the indicators of producing other crops grown in the Stavropol Territory, particularly,

cereals. Figure 5 shows the information that characterizes the dynamics of gross collection of basic crops grown in the Stavropol Territory.

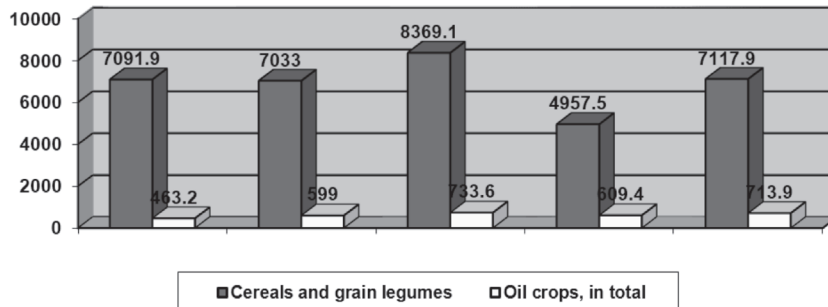


Figure 5: Gross Collection of Cereals and Oil Crops in All Categories of Households of the Stavropol Territory for 2009-2013, thous. tons

The analysis of dynamics of gross collection of oil crops according to all categories of households in the Stavropol Territory shows the dynamics of this indicator growth. Herewith, in comparison with the dynamics of the gross collection of cereals, the growth of oil crops is more intensive: 154.1% against 100.4% for cereals. The growth in the collection of oil crops has positive dynamics in all types of households. Especially intensive relative growth of gross collection is found in the population's households – 4 times. The aggregate growth of the gross collection of oil crops in the Territory was 154.1%. About 90% of the gross collection of oil crops is provided by agricultural enterprises, and 8-9% - by farms. The population's households collected less than 1% of the gross collection of oil crops.

The producers' interest in producing oil crops (through the example of sunflower) is mainly stipulated by higher indicators of the efficiency as compared to other agricultural crops (Figure 6).

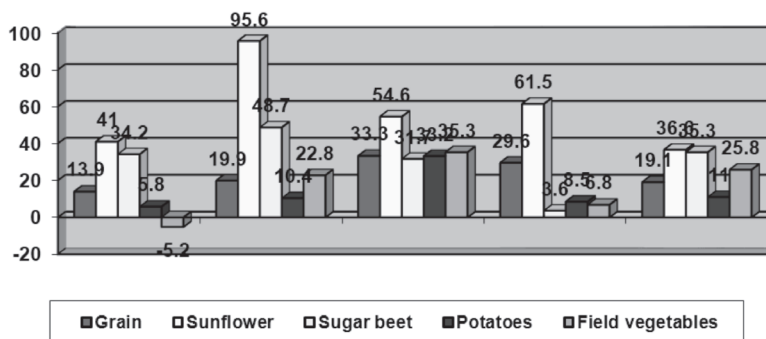


Figure 6: Profitability (Unprofitability) of Producing Agricultural Crops in the Stavropol Territory for 2009-2013, %

It is possible to make the conclusion that as a whole the production of sunflower is characterized by intensive growth when the gross collection increases subject

to decreasing cultivated areas. It is similar to the Russian-wide tendency, and characterizes the state of the production and entrepreneurship activity in this area.

Unequal allocation is observed in the structure of gross collection of products of the oilseeds sub-complex (Figure 7).

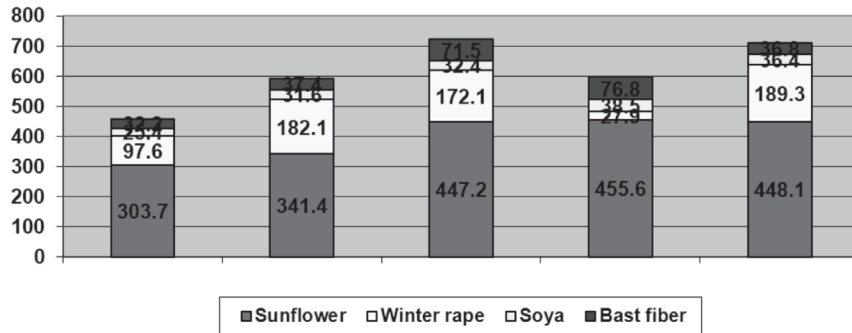


Figure 7: Structure of Gross Collection of Oil Crops in the Stavropol Territory for 2009-2013, thous. tons

During 2009-2013 about 90% of the gross collection was provided by sunflower and winter rape. Accordingly, peculiarities of the oilseeds sub-complex functioning are stipulated by specific characteristics and parameters that are characteristic for the production, processing, and consumption of sunflower and winter rape. In future researches we offer to be based on this hypothesis.

3.3.2. Zone Differentiation of Production Powers of the Oilseeds Sub-complex of the Region under Research

On the basis of the statistical data related to the Stavropol Territory, we considered the basic indicators that characterized zone peculiarities of oil crops production. The data for sunflower and winter rape are provided. For the period of 2009-2013 almost in all climate zones of the Territory the cultivated areas of sunflower increased – from 9.9% in zone 4 to 40.6% in zone 1. Zone 3 was an exception. However, it is necessary to note that 2013 was not the most favorable year in the period under consideration. The cultivated area for sunflower was minimum because of the peculiarities of placing sunflower in crop rotations (Table 2).

Table 2
Cultivated Areas of Sunflower (According to Zones), thous. ha

Zone	2009	2010	2011	2012	2013	2013 as to 2009, %
1	6.4	8.1	8.5	10.8	9	140.6
2	73.9	75	94.2	88.4	92.1	124.6
3	131.7	114.3	115.4	135	112.9	85.7
4	49.1	47.8	51.5	56.6	53.9	109.8

In 2013 the structure of cultivated areas differentiated according to climate zones was the following (Figure 8).

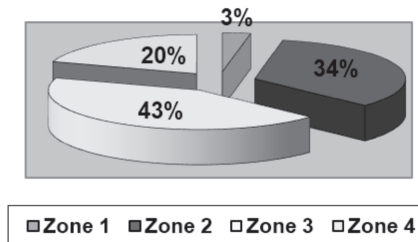


Figure 8: Structure of Cultivated Areas for Sunflower According to Zones of the Stavropol Territory in 2013, %

The greatest ratio – 43% of the cultivated areas for sunflower was found in the farms of zone 3.

The dynamics and volatility of the cultivated areas for rape is characterized by more expressive changes (Table 3).

Table 3
Cultivated Areas of Rape According to Zones of the Stavropol Territory, thous. Ha

Zone	2009	2010	2011	2012	2013	2013 as to 2009, %
1	0.3	3.5	2.4	0.6	7.85	25 times
2	28.6	34.5	29.8	11.34	51	178.3
3	27.3	47.5	38.3	9.9	56.6	2.1 times
4	18.4	23	28.1	5.9	14.8	80.4

As a whole the dynamics of the cultivated area for rape is also characterized by the growth tendency. Thus, the cultivated areas in zone 1 increased 25 times for the period under consideration. The increase in the areas is observed in other climate zones, too. Only in zone 4 demonstrated a 19.6% decrease.

In 2013 structurally the situation with areas for rape growing almost doubled the proportions that are peculiar for sunflower areas: the greatest ratio was observed in climate zones 3 and 4 of the Stavropol Territory whose total share was 83% (Figure 9).

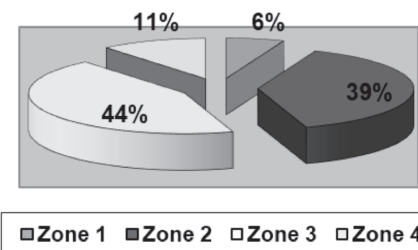


Figure 9: Structure of Cultivated Areas for Rape According to Zones of the Stavropol Territory in 2013, %

3.3.3. Analysis of the Market Environment

In order to understand the situation related to selling products of the oilseeds sub-complex, we will consider the dynamics and channels of selling oil crops (Table 4).

Table 4
Dynamics of Selling Oil Crops in the Stavropol Territory, thous. t

Total for the Territory	2009	2010	2011	2012	2013	2013 as to 2009, %
Sunflower	264,977	209,998	211,194	262,191	284,470	107.4
Soya	14,858	8,794	15,130	16,624	15,380	103.5
Rape	-	122,561	101,467	21,093	118,820	-
Bast fiber	72,424	23,117	37,071	47,509	23,061	31.8
Oil crops, in total	352,259	364,470	364,861	347,418	441,731	125.4

As a whole, the situation related to selling oil crops must be estimated positively: the tempo of growth of oil crops sales was 125.4%. The volumes of sales related to all basic crops increased except for only bast fiber whose sales decreased by almost 70% in 2013.

In the structure of the incomes from selling the products, the oil crops are inferior only to cereals. In 2013 their share was 17% (Figure 10).

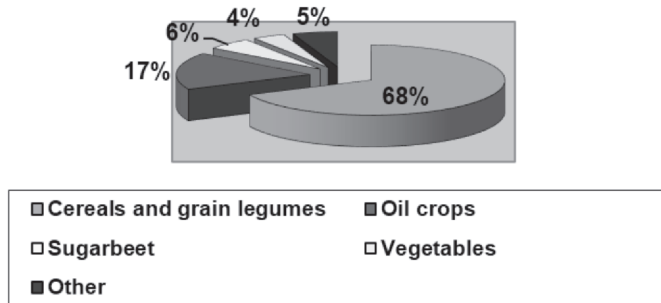


Figure 10: Structure of Incomes from Selling Crop Products in the Stavropol Territory in 2013, %

In terms of the climate zones agricultural producers of zone 1 became leaders according to the tempo of sales growth (Table 5). In absolute terms agricultural producers of zone 3 sold the greatest volume of their products.

Table 5
Dynamics of Selling Oil Crops (According to Zones), thous. t

	2009	2010	2011	2012	2013	2013 as to 2009, %
Zone 1	2,906	5,686	5,742	10,621	10,494	361.1
Zone 2	91,670	85,249	95,359	101,539	130,260	142.1
Zone 3	181,907	211,451	210,093	193,404	224,307	123.3
Zone 4	75,772	62,084	53,663	41,854	53,610	70.8

As for the sales, the allocation according to basic channels is the following (Figure 11)

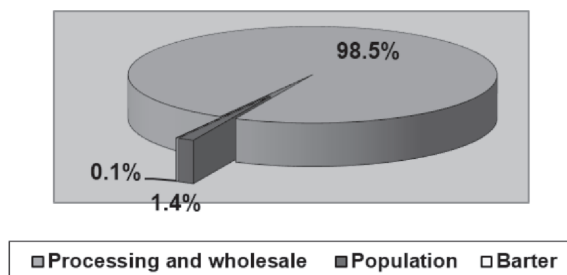


Figure 11: Structure of Selling Products of Oilseeds Sub-complex of the Stavropol Territory, %

According to the results of analyzing the dynamics and structure of the cultivated areas, yield, and volumes of sales, we think it is reasonable to define households that are leaders in producing oil crops in every climate zone for polling specialists involved in the area of oil producing in order to reveal the most considerable factors that have an impact on the production and sales, and efficiency of producing and selling products of the oilseeds sub-complex.

3.4. Comparative Analysis of the Technological Approaches Efficiency on the Micro-level

The forming conditions of the economic activity make agricultural enterprises to search for ways to minimize expenses, and neutralize the negative impact of natural factors. Here it is necessary to compare the economic efficiency of traditional technology and no-till technology.

It is possible to consider the peculiarities of the technology under study through the example of "Dobrovolnoye" LLC of Ipatovskiy Region in the Stavropol Territory. It has 6 years' experience of working according to the no-till system. The results are the following:

1. Consumption of fuels and lubricants decreased by half and was in average 28 liters per 1 hectar.
2. Number of the employees serving the crop rotation with the total area of 8,500 ha decreased from 49 down to 25 persons, with mechanizers - from 27 to 13 persons.
3. The park of machines and tractors on farms was optimized by decreasing the number and terms of basic technological operations. The number of tractors of all models had decreased from 24 down to 13 units, and, as a consequence, the depreciation deductions and expenses for the repair and purchase of spare parts considerably decreased.

According to the generalization of production and economic indicators for 2011, the level of profitability according to rape and sunflower by using the zero technology increased 1.4 times, and 3.5 times as compared to the traditional technology of growing (Table 6), respectively.

Table 6
Economic Efficiency of Producing Oil Crops According to Various Growing Technologies
(Based on the Materials of "Dobrovolnoye" LLC of Ipatovskiy Region), 2011

Indicators	Traditional technology		No-till technology		Divergence +, -	
	Winter rape	Sunflower	Winter rape	Sunflower	Winter rape	Sunflower
Yield, dt/ha	14.6	15.0	17.0	21.3	2.4	6.3
Manufactured products, t	325.0	132.6	357.2	3,024.0	32.2	2,891.4
Full prime cost, RUB/t	8,437.5	8,930.0	7,437.5	6,811.3	-1,000	-2,118.7
Average price of selling, RUB/t (excl. VAT)	13,090.9	10,200.0	13,090.9	10,200.0	-	-
Income from selling, thous. RUB	4,254.5	1,352.5	4,676.1	30,844.8	421.6	29,492.3
Profit from selling, thous. RUB.	1,512.3	168.4	2,019.4	10,247.4	507.1	10,079.0
Profitability level, %	55.1	14.2	76.0	49.8	20.9	35.6

The similar block of analytical calculations for 2013 showed that the expenses for producing sunflower made up RUB 6,605.1 per ton, instead of RUB 8,830.0 per ton in case of the traditional technology. For this time the total income from selling grew from RUB 9,387.5 to RUB 23,114.2 (Table 7).

Table 7
Economic Efficiency of Producing Oil Crops according to Various Growing Technologies
(Based on the Materials of "Dobrovolnoye" LLC of Ipatovskiy Region), 2013

Indicators	Traditional technology		No-till technology		Divergence +, -	
	Winter rape	Sunflower	Winter rape	Winter rape	Sunflower	Winter rape
Yield, dt/ha	17.0	16.7	21.0	27.1	4.0	10.4
Manufactured products, t	391.0	913.8	630.0	2,250.0	239.0	1,336.2
Full prime cost, RUB/t	8,955.2	8,830.0	7,725.4	6,605.1	-1,229.8	-2,224.9
Average price of selling, RUB/t (excl. VAT)	13,182.0	10,273.0	13,182.0	10,273.0	-	-
Income from selling, thous. RUB	5,154.2	9,387.5	8,304.7	23,114.2	3,150.5	13,726.8
Profit from selling, thous. RUB	1,652.7	1,318.6	3,437.7	8,252.7	1,785.0	6,934.1
Profitability level, %	47.2	16.3	70.6	55.5	23.4	39.2

Thus, under the current climate conditions of the Stavropol Territory, highly efficient production of sunflower winter rape is possible on the basis of the competent use of the no-till technology.

4. DISCUSSION

The general results of discussing problems related to the oilseeds sub-complex functioning in the scientific community and their correlation with the results of researches [Masahisa Fujita, Paul Krugman, Anthony J. Venables (1999), Loveridge, S. (2008), Dzhukha, V.M. (2013), Vasilyeva M.V. (2011), Lapina E.N., Sobchenko N.V., Kuleshova L.V., Shamrina S.Y. (2015), Sklyarov I.Y., Sklyarova Y.M., Latysheva L.A., Podkolzina I.M. (2015), Yarkova T.M., Svetlakov A.G. (2013), Searle J.R. (2005)] confirm the opinion of authors about the need to, firstly, constantly take into account not only seasonal but also market factors of its development, and secondly, about the increasing need to reduce the production expenses under conditions of economic instability. Along with this, here it is planned above all to solve the problems related to employment in the rural area, social development of agrarian communities, and maintaining mental and ethno-social characteristics of the agrarian economy.

Further prospects of the oilseeds sub-area are related to searching for measures on decreasing production and commercial risks. One of the variants of risk management in the agrarian sector is the implementation of the no-till technology. This is the technology when the plant production is managed, forecasted, and economically efficient. If in case of the current organization of agriculture the yield depends on the nature for 80%, within the no-till system the impact of weather and climate on the efficiency of agricultural production is reduced to 20%. The remaining 80% are related to technological operations and management.

No-till is not only sowing in soil without processing it but also a set of measures aiming at launching sophisticated interrelated biological and chemical processes in soil to obtain agricultural crops yield.

No-till is based on three key moments:

- Crops rotation,
- No-till by using special sowing equipment under constant covering of soil with plant remnants, and
- Rational use of fertilizers and crop protection agents.

At the same time there is no unified formula of applying no-till that is admissible for any natural and climate conditions. Thus, we see prospects of the scientific-research reflection in adapting this technology to various "oil terroirs", calculating economic effects from using modified variants of technological techniques, and stipulating the selection of the optimal variant. For this purpose it is necessary to

develop the interrelation with research and production and experimental centers, contribute to distributing and transferring technologies, and develop the relevant infrastructure.

5. CONCLUSION

Generalizing the results of the conducted research, it is necessary to note that the oilseeds sub-complex that plays an important role in providing the population's food balance and meeting medical standards of products consumption and acts as a comprehensive production system suffers from the impact of a number of factors of various etiology and level of occurrence. Prospects of the oilseeds sub-complex development are identified with elements of the factorial environment that have the most apparent disturbing impact and strengthen the effect of positive factors and conditions, and minimize, neutralize or compensate negative ones. Thus, we have offered and approbated the methodology of system and hierarchal analysis of the oilseeds complex functioning. It includes the successive analytical research of the operation of global factors of the world environment, revealing of the regional production and technological specificity, as well as the analysis of economic efficiency of various technological platforms of oil crops production. The formed methodological platform of carrying out the system and hierarchal analysis of the oilseeds sub-complex functioning is universal and can be used everywhere (according to areas of growing oil crops) to define reserves to improve the economic efficiency of the agricultural production. It may ultimately result in initiated programs and strategies on the target development of the oil agricultural and natural use, transfer to the project agricultural activity on producing and processing separate crops taking into account global factors and local specificity of production stipulated by the aggregate of conditions of the natural and climate etiology.

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