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UNCERTAINTY IN AGRICULTURE: A REGIONAL PERSPECTIVE

Summary: In the article it is argued the impact of uncertainty on the economy of agricultural enterprises, identified constraints development of agriculture in the region. Determined by the interaction of agricultural enterprises with the market environment, the natural and economic conditions and their impact on the functioning of agriculture. The role of government support in mitigating risks of uncertainty.

Keywords: uncertainty, risk, agriculture, state support

Agrarian production is directly related to the situation of uncertainty and risks, which are the environment in the functioning of agricultural enterprises. This is due to the fact that agriculture has many distinctive features that serve as an additional source of risk (the biological nature of the resources used and the effect of weather on production results).

The dependence of agriculture on soil and climatic conditions predetermines the identification of regions that are, to a certain extent, adapted to its management. One of these regions is the Volgograd region, which has significant scientific and production potential, developed infrastructure and transport communications, diversified industry and agriculture. The main type of economic activity carried out on its territory is agricultural production.

According to the combination of natural factors that have a significant influence on the development of agricultural production, five soil zones are distinguished in the region: the steppe zone of chernozem soils, the dry steppe zone of dark chestnut soils, the dry steppe zone of chestnut soils, the left bank zone of

the dry steppe zone of chestnut soils and the semidesert zone of light chestnut soils (Table 1).

The predominant place in the agricultural production of the region is given to crop production, the share of which in recent years is 60-70% of the gross product of agriculture (on average in Russia - 50%). The main share in the structure of crop production belongs to grain production (70% of all sown areas). The developed production of grain crops in the region is conditioned, first of all, by the price situation of the agrarian market and by soil and climatic conditions.

Table 1

Characteristics of the Volgograd Region's Natural Areas Relating to Uncertainty of Agricultural Production

Indicator	Natural zone				
	Steppe zone of chernozem soils	Dry steppe zone of dark chestnut soils	Dry steppe zone of chestnut soils	Left-bank zone of the dry steppe zone of chestnut soils	Semi-desert zone reduced - chestnut soils
Limits of soil bonitet, point	76,2-97,3	58,9-87,7	50,8-68,4	54,4-64,1	45,1-53,4
Average soil bonitet, point	78,8	72,4	56,6	58,3	47,9
Average annual rainfall, ml	409,5	388,7	352,1	318,3	371,3
Temperature in degrees:					
minimum	-44	-42	-44	-40	-39
maximum	+45	+46	+45	+45	+46

Frequently recurring droughts, approximately once every three years, cause enormous damage to the agriculture of the region. In addition, during the winter period of 2010. on the territory of the region, as a result of the influence of unfavorable agrometeorological phenomena, the sowing of winter crops on the area of 445,000 hectares occurred. No less depressing picture was noted in 2012. Due to soil drought and dry winds in the Volgograd region, 600 thousand hectares of crops were killed. Material damage from the consequences of hazardous natural phenomena amounted to 5,48 billion rubles., The costs of agricultural producers for cultivation of dead crops – 2,4 billion rubles.

2014 was characterized by relatively favorable weather conditions for the growth and development of crops. In particular, with a deficit of precipitation in

the spring-summer vegetation period, the reserves of productive moisture accumulated in the soil in the autumn-winter period provided satisfactory conditions for the moisture supply of agricultural plants, which was reflected in the yield indicators of agricultural crops.

Table 2

Dynamics of yield and crop area of agricultural crops in Volgograd region by farms of all categories

Years	Cereal and grain-and-leguminous crops	Sunflower	Mustard	Vegetables	Potatoes	Food melons
	Productivity, Centners per hectare					
2010	12,0	7,7	4,5	256,0	93,7	57,3
2011	17,2	11,5	6,6	270,5	112,6	52,4
2012	16,4	9,1	5,9	291,7	115,8	63,6
2013	17,5	13,9	4,1	299,5	119,6	57,1
2014	20,4	12,5	6,8	299,6	128,5	65,7
2015	17,3	12,8	5,1	300,3	135,2	61,7
2016	24,0	14,3	6,4	293,6	133,8	62,0
	acreage, thousand per hectare					
2010	1619,9	827,8	20,1	28,7	33,4	52,7
2011	1630,9	790,2	25,5	31,7	33,7	70,2
2012	1963,3	577,4	9,3	27,8	34,6	47,3
2013	1899,5	592,5	41,0	27,5	33,7	51,1
2014	1950,9	600,6	30,6	26,4	31,3	41,7
2015	1922,1	581,1	40,1	29,9	31,8	47,4
2016	1920,1	587,0	41,0	31,1	31,6	46,5

The instability of crop production can not but affect the livestock. However, the suitability for long-term storage of feed allows you to create insurance stocks in case of deterioration of the economic or market situation. Thus, in arid 2010, thanks to the feed reserve created in previous years, an insignificant reduction in the provision of livestock for farm animals was achieved, which positively affected the production of livestock products (Table 3).

The risks of livestock breeding depend to a large extent on the biological characteristics of farm animals. In dairy cattle breeding, losses or non-receipt of the desired result are determined by the presence in the herd of pedigree livestock, the herd structure, the duration of the service period and lactation, the timing of fattening of the young and the use of the brood stock, and maintenance technology.

Table 3

Dynamics of food supply and livestock production in the Volgograd region

Indicator	2005	2010	2011	2012	2013	2014	2015
Livestock products, million rubles	13372	25727	25602	30596	28874	32675	36695
Feed consumption for the conventional head, centners of feed units	25,8	24,9	25,8	25,7	25,7	25,6	25,6
including concentrated	12,3	12,4	12,8	12,2	11,9	12,0	11,8

Certain adaptive possibilities in livestock breeding are found in pig breeding, sheep breeding, poultry farming, which are relatively early-maturing sectors that do not require significant capital investment and allow the capital invested in production to return fairly quickly. However, with regard to the pig industry, its development in the short term in the region after several outbreaks of African swine fever (ASF) is problematic enough. Since 2011, the region has been decreasing the number of pigs annually: in 2011 - by 50.6 thousand heads, in 2012 - by 92.7 thousand heads, 2013 - by 64.3 thousand heads, 2014 g - by 62.8 thousand heads. Only in 2015 there were some positive trends in the industry: a 5% increase in the number of pigs on farms of agricultural organizations, 6% in farmers, and 15% in personal households. As a result, at the beginning of 2016, there were 277,200 heads of pigs in farms of all categories of the oblast, which is 23,600 more than in the previous period, but much less (by more than 1,7 times) than in 2011.

Getting into unfavorable conditions, commodity producers reduce the least productive part of the livestock, use less energy-intensive and cheap feeds.

Opportunities for reducing risks through adaptation are also available in the processing of agricultural products. In the dairy and meat industries, it is relatively quick to change and increase the range of products from the same raw materials, taking into account the market situation. Dairy and meat processing plants of the region today produce more than 100 products, and bakeries - about 400, all of which are in demand with the consumer. The same opportunities are available when processing potatoes, vegetables and grains.

Despite the fact that the region occupies leading positions in the production of mustard (1 place in the Russian Federation), vegetables, melons and fruit crops (2 nd place in the Russian Federation), it is experiencing difficulties in the development of animal husbandry. Among the deterrent factors in the development of the agro-industrial complex, we can distinguish:

- insufficient volume of work to increase the intensification of agricultural production;

- a high proportion of personal ancillary and farmer households with lower productivity than large farms that have better access to finance, and therefore the acquisition of productive machinery, the involvement of skilled workers, the use of new technologies;

- the lack of a processing industry, poorly developed infrastructure for marketing products;

- imbalance in prices for various agricultural products [1].

Significant opportunities for broader counteraction to various kinds of natural and atmospheric threats in agriculture are associated with technology and technology. The high level of wear and tear of machinery and equipment leads to a lack of compliance with the systems of agriculture and technological proportions of production, to a reduction in the number of even the necessary technological operations, which reduces the stability of crops in risky farming. According to experts, technical backwardness in the agro-industrial complex reduces yield by 30-50% [2]. In comparison with highly developed agrarian countries, domestic agricultural producers do not sufficiently use the technical, technological, genetic and other achievements of science and advanced experience. In many respects, for this reason, the level of intensification of the industry lags behind the world average achievements, for example, in grain production it is 0.59 in the last year (yield ratio in Russia is 19 centner per hectare to the world average of 32 centner per hectare).

The reduction in the total amount of equipment is burdened with physical deterioration: a significant percentage of the existing machinery in the farms has

worked out its service life and is beyond depreciation, while the enterprises do not have the necessary capacity to replenish the fleet of equipment (Table 4).

Table 4

Dynamics of correlation between the percentage of liquidation and the percentage of renewal of equipment in agricultural organizations of the region

Indicator		Tractors	Combine harvesters	Forage Harvesters	Sprinklers and plants (without irrigation)	Milking plants and aggregates
2000	liquidation, %	7,1	8,2	14,0	13,9	14,8
	renewal, %	1,3	1,7	1,7	0,4	0,6
2005	liquidation, %	5,1	7,4	17,7	24,0	12,0
	renewal, %	1,5	4,5	1,2	1,5	0,7
2010	liquidation, %	4,1	6,2	12,4	3,5	10,9
	renewal, %	1,9	3,3	2,7	1,4	-
2014	liquidation, %	3,0	4,4	9,6	12,3	8,1
	renewal, %	1,8	3,3	4,8	3,2	1,7
2015	liquidation, %	5,1	6,9	16,1	13,5	6,3
	renewal, %	2,6	4,4	6,9	-	2,4
2016.	liquidation, %	3,7	5,1	9,7	3,8	8,5
	renewal, %	2,5	6,2	0,8	1,6	1,6

The lack of technology leads to an increase in operation and load per unit of technical means. Since 2000, the load of arable land has significantly increased by 1 tractor - 2.2 times, for combine harvesters - 2.1 times. Most agricultural machines have low technical and operational performance, are characterized as insufficiently reliable and low-operational. At the same time, the energy intensity of labor is increasing, and as a result, labor productivity. In recent years, it has grown by 23%. This indicates the beginning of a qualitative transformation of the material and technical base of agriculture.

The average monthly salary of agricultural workers in 2014 was equal to 15239 rubles. In 2015, the incomes of workers in the industry increased to 16717 rubles. And if in 2014 the wages in the industry were 7589 rubles. Below (67%) than the regional average, in 2015 the incomes of the villagers turned out to be 30.7% less than the industry average level in the region [3].

As a rule, the human factor refers to the internal conditions of production. A person occupies an important place in the management process, however the work

performed is automatized. First of all, it concerns agriculture, where practically all production processes are connected with people. The production cycle in agriculture consists of two parts - with human participation and without participation [4]. That is, the subject can take the position of an outside observer (waiting for results without any intervention) or take an active part. Participation of a direct employee as a key figure in any kind of work can be associated with the emergence of uncertainty associated with both a lack of understanding of the tasks, opportunities, and abilities to address them, and with the continuing outflow of economically active population to the regional centers and cities of the region. In just one year the number of people employed in agriculture fell by 12.4 thousand people and amounted to 197.6 thousand people in 2016. [5]. The shortage of personnel in the industry is the reason for the high level of not realizing many promising investment projects in the agro-industrial complex, increasing the bankruptcy of agricultural enterprises, increasing the retirement of valuable agricultural land.

Recently, the Russian economy has increased food imports, and it has reached dangerous limits for the country, this has led to the emergence of the problem of ensuring food security. In addition, the Russian market for a long time was under the control of foreign commodity producers. The political events of 2013 - 2014, which marked the food sphere as a bargaining chip in a big geopolitical game, showed how destructive-risky for the national economy the country's food dependence may be. At the same time, new risks in the food sphere represent the regional economy as a unique stimulus for development along the path of import-substituting re-industrialization, as well as market uncertainty.

The role of the price factor in increasing the profitability of agriculture and creating investment conditions for extended reproduction is indisputable and necessitates the analysis of market or price risks. The importance of price risk increases in the context of the liberalization of the world economy and world trade, the reduction of state price support within the WTO. Regarding the prices for the main types of agricultural products, the situation develops in such a way that their

growth at the regional level, as well as on the domestic market of Russia, continues for a short time, as the reasons for the price increase are almost exhausted.

It should be noted that prices will rise slightly for reasons related to instability in Ukraine, as domestic prices are tied to the world market, and the world market reacts to the "Ukrainian factor". Meanwhile, there are no fundamental reasons for the rise in prices on the world food market. This problem can be solved by regulating the relatively balanced supply and demand through state orders, quotas, intervention purchases within the minimum price level. In general, the prospects for the development of import substituting agricultural sectors in the region will be determined by the temporary preferences of investors who expect the authorities to give clear signals that a departure from the WTO rules will be of a lasting nature.

The national markets of countries in different parts of the world are interconnected as never before. Price volatility has become the same habit in the markets of agricultural products, as well as on financial [6]. And this need to be considered. Confirmation of these findings is the situation that develops in the sunflower market (Table 5).

Table 5

Conjuncture of the regional market of sunflower seeds (Volgograd region)

Years	Change in the sunflower market, %		
	demand	supply	price
2010	-10,0	-21,7	51,4
2011	14,4	89,3	-27,4
2012	-20,1	-34,0	-87,7
2013	28,9	60,2	-12,0
2014	42,1	-4,7	18,4
2015	-23,1	2,9	57,4

Consequently, price changes are influenced not only by market factors, as demand and supply for agricultural products in the absence of state regulation are formed independently of the market price [7]. All this increases the uncertainty of risks and forces agricultural producers to change their business strategy.

Market risk is also expressed in price fluctuations in the markets of material and technical resources, to which the agricultural enterprises are parties. Such fluctuations include changes in prices for resources or products, changes in the competitive environment, changes in the terms of supply or sales, and so on.

One of the factors affecting the efficiency of agricultural production is state support for agricultural production. The need for this is determined by the influence of such factors as: the impact of soil - climatic conditions; rapid deterioration of agricultural production assets; a low degree of monopolization of rural commodity producers in comparison with other branches of the economy; high level of capital intensity of agriculture and its low profitability; increased disparity in prices for agricultural products and industrial products, coming in the order of material resources for agricultural production.

An important area is the use of land by the agrarians for the purchase of agricultural machinery. With the help of subsidies, the agricultural machinery fleet has been significantly upgraded, the agrarians purchased 1500 machines at a price 25% below the market price - the difference in value is compensated by the state. State support performs a stabilizing, supportive function, which is undoubtedly significant in the conditions of uncertain functioning of the agrarian business.

Thus, it was established that agricultural production is subject to the influence of uncertainty factors that lead to risks in economic activity. Such factors are: natural conditions, unstable market conditions, political and economic instability.

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