

Vinnichek Luybov

D.Sc. (Economics), Professor,

Head of the Department of

Organization and Informatization of Production,

FSBEE HE Penza State Agrarian University,

Penza, Russian Federation

8-12, 2nd Pitomnikovaya Str., Penza, 440014, Russian Federation

l_vinnichek@mail.ru

ORCID ID: 0000-0002-6127-7201

PECULIARITIES OF SPECIALIZED ECONOMIC ZONES OF CROP PRODUCTION FORMATION IN THE REGION

Abstract: Some principles of specialized zones of crop production formation are revealed in the paper. The definition “specialized natural economic zone” is given. The factors (soil and climatic, economic, agro-ecological, the scientific and technical progress (STP), social- economic and legal) promoting and constraining development of specialization in crop production are revealed, and their influence on development of specialization of natural and economic zones of the region is determined.

Due to the heterogeneity of natural and economic conditions and a great variety of soil cover in the territory of the region, it was possible to distinguish four natural and economic zones in Penza region of the Russian Federation, in particular: I - Vadinsk-Mokshan, II - Belinsk-Serdobsk, III - Nikolsk-Gorodishche, and IV - Kuznetsk and Lopatinsk. Each of them is researched in this paper.

Keywords: specialized zone, specialization, crop production, natural economic zone; Penza.

JEL Classification: O13, Q10

Introduction

The effective functioning of the agrarian sector substantially depends on its rational distribution and the areas of specialization. For the last 30 years, there have been negative changes in the specialization of agricultural industry, due to the destruction of earlier developed production links, the reduction or complete cessation of production of some crops, a decrease in the product competitiveness, and the increase in territorial disproportions in their placement.

If it is possible to create conditions for the production of livestock products almost everywhere, then crop production mostly depends on the natural and climatic and economic conditions that cannot always be le-

veled by the achievements of scientific and technological progress, and therefore it is necessary to form specialized zones in which optimum conditions for cultivation of crops are necessary.

Results

Throughout all history of the mankind, providing the population with food is one of the most important national objectives. Improvement of providing the population with food is an important social and economic task facing Russia (Moiseev A.V. and Kindaev A.Yu., 2015).

Social-economic development and transformations of the last decades in many countries of the world economy demonstrated the essential developments in the ways of conducted reforms and strategies of transformations (Rassadin V.V., Pavlov A.J., Batova V.N. and Kolesnikov A.V., 2014). The relevance of this problem is also growing due to the process of economic globalization (Batova V.N. and Pavlov A.J., 2013).

The specialized natural and economic zone is the territory uniting a group of administrative areas or a part of their territory where developed, on the basis of use of the favorable combination of natural and economic conditions for this or that direction of agrarian production, the production of the certain types of agricultural products which are characterized by rather high production yield with a unit area at high quality and low production costs that promotes the increase in production of products (Vinnichuk L. B., 2011). The formation of such zones for agricultural crops is determined, first of all, by soil and climatic conditions. Formation of specialized zones of crop production must be based on the following principles:

- the balanced development of crop production with a system of logistics, processing and marketing;
- self-sufficiency of the population of the region with the main types of crop production;
- a combination of maximum productivity and efficiency of use of natural and resource capacity of the region;
- practical feasibility, financial security and legal admissibility of options for the development of accommodation and specialization;
- diversification of crop production in view of market conditions;
- accounting of ecological and biological features of agricultural crops and compliance of structure of crop rotations to an ecological condition of an agro-landscape;
- a combination such processes as location and deepening of specialization in production of crop products in the natural and economic zones and administrative regions of the region with the development of a division of labor between them;

- Promoting the development of rural areas as a single territorial historically developed complex which is carrying out productive and economic, social and demographic, cultural, nature protection and recreational functions.

Forming of specialized zones of cultivation of crops, must be considered the developed economic, soil and climatic, agro-ecological conditions (Altukhov A. I., 2010, Altukhov A. I., 2014a, Altukhov A. I., 2014b, Altukhov A. I., 2016a, Altukhov A. I., 2016b, Silayeva L. P., 2016).

To solve these problems, it is necessary to justify the priority directions for the development of crop production and the formation of specialized zones for the production of agricultural crops on their basis.

The main factors promoting the development of specialization of production of crop products in the Penza region are:

- soil and climatic - black soils occupy more than 75% in soil structure of the region, a sufficient amount of heat resources and level of moistening (State Customs Committee) for cultivation of the main crops traditional for a midland of the European part of the country, the presence of floodplain lands, water storage basins and ponds suitable for the development of land reclamation;

- economic - developed transport infrastructure, the current system of grain storage, the presence operating sugar factories in the region, commissioning of oil extraction plant and expansion of;

- vegetable oil production, development of poultry and pig production in the region, contributing to the growth in grain demand, the presents of state support of crop and investment projects in agriculture, the arrival of large investors in crop production (mainly in the areas Vadinsk-Mokshan and Belinsk- Serdobsk zones), the presence of large amounts of unused arable land and fallow land, which could be put into circulation for the expansion of crop production;

- Scientific and technical progress is shown in the modernization of the machine and tractor park in large scale enterprises of the region, the introduction of intensive resource-saving technologies for the production of agricultural crops, the scientific provision of crop production by the State Scientific Institution "Penza SRIA," scientific and personnel support from the FSBEE HE of the Penza State Agrarian University.

Due to the heterogeneity of natural and economic conditions and a great variety of soil cover in the territory of the region, it is possible to distinguish four natural and economic zones: I - Vadinsk-Mokshan, II - Belinsk-Serdobsk, III - Nikolsk-Gorodishche and IV - Kuznetsk and Lopatinsk (Figure 1).

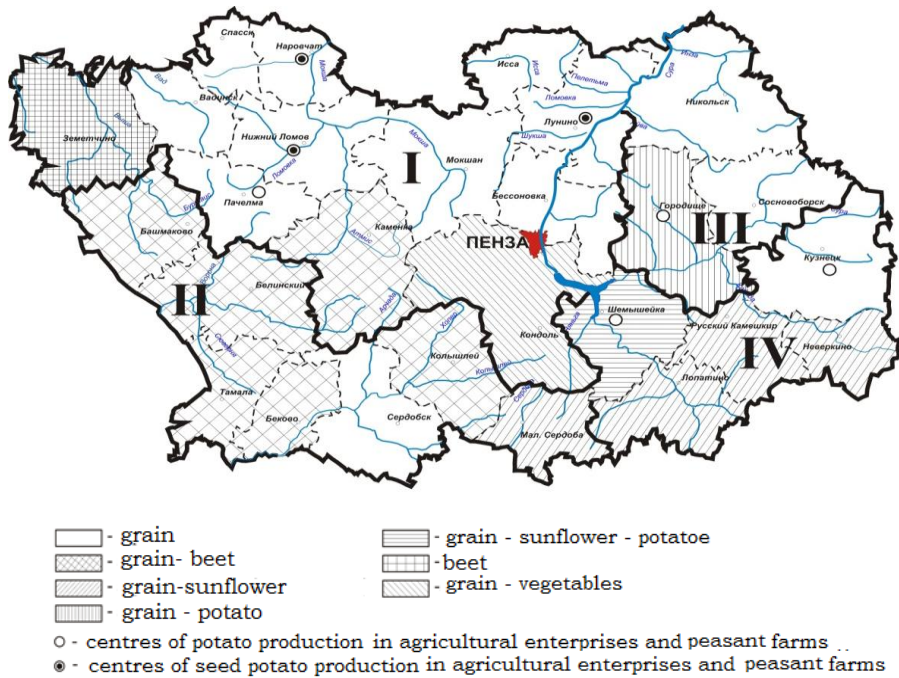


Figure 1. The developed specialization of crop production in areas of the Penza region

Source: Author’s research

The Vadinsk-Mokshan zone occupies central and north-western areas, includes 12 administrative areas where averages on productivity of an arable land of the soil (24.8-28.6 points) are concentrated. Here it is concentrated: 48.8% of acreage of grain crops, 50.6% - sugar beet, 23.6% - sunflower from regional level. Placement of sugar beet is characterized by increased concentration in Zemetchino and Kamensk districts. The centers of sunflower production are the Kamensk and Penza districts. In the structure of the grain wedge, winter wheat (40.8%), barley (22.1%) and spring wheat (14.6%) prevail.

The Belinsk-Serdobsk zone is located in the southern and south-western part of the region and includes 7 administrative districts. Soils in this zone are characterized by the highest site class in the Penza region (28.7-37.0 points). Soils in this zone are characterized by the highest site class in the Penza region (28.7-37.0 points). Under grain crops 35.0% of acreage, with sugar beet - 49,4%, sunflower - 44,6% of total area of crops of these cultures of areas are occupied. The production of sunflower is characterized by active development in all areas of the zone, and sugar beet by the reduction of acreage. In the structure of the grain wedge, winter wheat (36.1%), spring wheat (25.1%) and barley (17.4%) prevail.

The Nikolsk-Gorodishche zone covers the north-eastern part of the region and unites three administrative districts. It accounts for 4.0% of all acreage of grain crops in the region. In the structure of the grain wedge the share of oats is 32.8%, winter wheat and winter rye - 21.7% and 20.4%, respectively. Technical crops in the areas of the zone are practically not cultivated, the limiting factors of their production are the low fertility of most part of the soils (gray and light gray forest with a productivity of 15.0-19.0 points), and a lack of thermal resources.

The Kuznetsk-Lopatinsk zone covers 5 administrative districts located in the south-eastern and eastern part of the region. In the areas of this zone, the arable land category by productivity is average (24.4-24.0 points). In the Kuznetsk-Lopatinsk zone, 12.1% of the acreage of cereals and 31.5% of sunflower are concentrated. Sugar beet in this zone is not produced due to the remoteness of sugar plants. In the structure of the grain wedge, winter wheat is 39.6%, oats - 16.4% and winter rye - 14.9%.

The heterogeneity of placement and specialization of crop production as a form of social division of labor is expressed that change of placement of production of this or that crop leads also to change of its specialization in the region, a natural and economic zone, the administrative area or in separately taken economy.

The specialization of crop production of the Penza region was determined on the basis of analysis of the structure of the realized crop production in agricultural organizations and peasant farms. The largest share in the structure of sold crop production by agricultural organizations and K (F) X of the Penza region consists of grain crops (58.1%), sugar beet (26.9%). The share of oilseeds in the proceeds from sales of crop production in the region as a whole does not exceed 5.8%. In the Penza region the grain-beet cultivation specialization of plant growing was formed. A similar specialization of crop production has developed in the Vadinsk-Mokshan and Belinsk-Serdobsk zones.

In the Vadinsk-Mokshan zone, the share of grain in the structure of sold products reaches 58.8%, sugar beet - 25.9%, vegetables of the protected soil - 9.7% (that is caused by placement in the Penza region).

In the Belinsk-Serdobsk zone, the share of grain in the proceeds from the sale of crop production is 56.7%, sugar beet - 34.3%, sunflower - 7.2%.

The Nikolsk-Gorodishche zone is characterized by the highest share of cereals (77.7%) in the proceeds from the sale of crop production. The share of potatoes is 16.7%. In this zone there was a grain specialization of plant growing.

In the Kuznetsk-Lopatinsk zone, the share of grain in the proceeds from the sale of crop production is 65.3%, sunflower for oilseeds - 23.6%,

that is much higher in comparison with other natural and economic zones. In this zone it was created grain - olive specialization.

The main factors constraining the development of specialization in the production of crop production in the Penza region include:

- soil and climatic - concentration of agricultural lands with low fertility of soils in districts of Nikolsk-Gorodishche and Kuznetsk and Lopatinsk zones;

- economic - increase in disproportions in the placement and a level of development and efficiency of crop production, state support for crop production without taking into account zonal features, low efficiency of crop production by agricultural producers in most farms in the region, low technological level of production in most farms in the region, disintegration of agricultural producers in the region, weak development or total absence of production links within the existing regional product sub-complexes, the preservation of the disparity of prices for products of agricultural industry and the material resources necessary for its production, rather low capacity of the regional crop production market;

- agro-ecological - violation of crop rotations, reduction of doses of organic and mineral fertilizers, active overgrowing of forests and weed vegetation of deposits, destruction of land reclamation system;

- scientific and technical progress - the insufficient level of interaction of agricultural producers and scientific organizations in the sphere of maintaining scientifically based system of agriculture, introduction of non-agricultural crops into crop rotation;

- social and economic - outflow of labor resources from agriculture, the low pay level of crop workers, lack of skilled labor, low attractiveness of labor for young people;

- legal - insufficient development of a regulatory framework in the sphere of the land relations, allowing a possibility of the inefficient use of lands of agricultural purposes, due to the lack of efficient mechanisms of impact on unfair lessees and owners of agricultural holdings.

The above-mentioned factors, constraining the development of placement and specialization of crop production in the Penza region, are inherent in all natural and economic zones and the areas of plant growing. At the same time, in order to substantiate the prospects of development of its placement and specialization, it is necessary to concretize the problems characteristic for the placement and development of specialization in the production of separate crops.

On the basis of the conducted analysis of placement and level of specialization of crop production in the Penza region, the influence of factors constraining and promoting the development of specialization in natural and economic zones of the Penza region is summarized (Table 1).

Table 1. The influence of factors on the development of specialization and placement of crop production in the Penza region *

Factors	Natural - economic zones			
	Vadinsk-Mokshan	Belinsk-Segdobsk	Nikolsk - Gorodishche	Kuznetsk-Lopatinsk
Soil-climatic:				
- type and fertility of soils;	(+ + +)	(+ + +)	(- - -)	(-)
- level, moistening;	(+++)	(++)	(+)	(+ +)
- thermal resources	(++)	(++)	(- -)	(+ +)
Economic:				
- development of transport infrastructure;	(+ + +)	(+ + +)	(+ + +)	(+ +)
-development of the storage and processing system:				
Sugar factories	(+++)	(+++)	0	0
Elevators;	(++)(-)	(++)(-)	(+++)	(+++)
Feed mills;	(+)	(+)	(+)	(+)
Oil factories and workshops	(++)	(-)	(-)	(+)
- material and technical resources condition;	(++)	(++)	(+)	(+)
- level of state support;	(++)	(++)	(++)	(++)
- competitiveness and quality of crop production;	(++)	(++)	(+)	(+)
- capacity of the regional market;	(+)	(+)	(+)	(+)
- efficiency of crop production;	(+)(-)	(+)(-)	(+)(-)	(+)(-)
- customs duties;	(+++)	(+++)	0	(++)
- investment appeal of a zone;	(++)	(++)	(-)	(+)
- level of integration development	(+)	(+)	(+)	(+)
Agro-ecological				
- optimal crop rotation;	(+)	(+)	(+)	(+)
- phytosanitary condition of the territory.	(+++)	(+++)	(+++)	(+++)
Scientific and technical progress				
- resource-saving technologies;	(+)	(+)	(+)	(+)
- qualitatively new machinery and equipment;	(++)	(++)	(+)	(+)
- new varieties and hybrids.	(++)	(++)	(+)	(+)
Social and economic				
-the availability of labor resources;	(+)	(+)	(+)	(+)
-the level of incomes of the population;	(-)	(-)	(-)	(-)
-Dynamics of the population.	(-)	(-)	(-)	(-)

*) Influence of factors: 1) promote specialization development - extent of impact: high (+ + +), average (+ +), low (+); 2) influence of the factors constraining specialization development - extent of impact: high (- - -), average (- -), low (-); 3) influence of a factor is absent 0.

Source: Vinnichek L. 2011

Estimation of the influence of factors on the natural and economic zones in the context of their groups showed that some of them only contribute to the development of specialization ("+"), others - restrained (marked "-"), and in some cases there is no influence of the factor (marked "0"). Given the simultaneous influence of factors contributing to and inhibiting the development of specialization, in the column two signs "+" and "-" were put.

The influence of soil-climatic factors can be estimated unambiguously, due to the fact that their change in time occurs rather slowly and it is practically impossible to regulate these processes. At the same time, economic factors are quite dynamic over time, so the presence of a grain storage system in the Vadinsk-Mokshan and Belinsk-Serdobsk zones has a favorable effect on the development of its production and marketing, but in case of further increase in grain production, over 1,400,000 tons, storage capacity won't be enough. In this regard, in Table 1 the influence of this factor is estimated doubly "(+ +) (--)". However, knowing the volume of production for the future, it is possible to take measures to increase the production capacities of the storage and processing of agricultural products.

Conclusion

The assessment of the influence of factors on the specialization of crop production in the region showed, that in the Penza region the developed placement and specialization of this industry in some cases do not consider a favorable combination of agro-ecological, soil and climatic and economic conditions. The most effective use of factors promoting and leveling of the factors constraining development of specialization should be the basis for forming in the territory of the region of perspective specialized natural and economic zones of crop production. This will allow increasing the efficiency of crop production and its competitiveness.

Bibliography

ALTUKHOV, A.I., 2010. Conceptual foundations of distribution and specialization of agro-industrial production / A.I. Altukhov, O.V. Asmus and others - Moscow, 104

ALTUKHOV, A.I., 2016. Methodology and mechanisms for improving the location and specialization of agro-industrial production / A.I. Altukhov, L.P. Silaeva, and others - Kursk, 155

ALTUKHOV, A.I., 2016. Methodology of rational allocation and deepening of specialization of agro-industrial production / A.I. Altukhov, L.P. Silaeva, and others - Dushanbe, 152

ALTUKHOV, A.I., 2014. Placing and specialization of agricultural production: problems and ways of their solution / A.I. Altukhov, L.P. Silaeva and others - Kursk, 202

ALTUKHOV, A.I., 2014. The main directions of the regional location and specialization of agro-industrial production in Russia / A.I. Altukhov, A.I. Trubilin and others - Krasnodar, 183

BATOVA, V.N., PAVLOV, A.J., 2013. Providing economic safety of business processes in the conditions of implementing the concept of stable development. *World Applied Sciences Journal*, 27 (4): 538-542. DOI: 10.5829/idosi.wasj.2013.27.04.13675

GRZNÁR, M., SZABO, Ľ., 2012. Disparities in the utilisation of production factors in the agriculture of Slovakia and of the European Union *Agric. Econ. - Czech*, 58: 49-55

MOISSEEV, A.V., KINDAEV, A.YU, 2015. Simulation of insurance risks. *Journal of Applied Engineering Science*, 4: 257-264.

RASSADIN, V.V., PAVLOV, A.J., BATOVA, V.N., KOLESNIKOV, A.V., 2014. Evolutional-genetic approach to formation of sustainable development indicators of the agricultural territories. *Journal of Environmental Management and Tourism*, T. V. 2(10): 230-236. DOI: [http://dx.doi.org/10.14505/jemt.v5.2\(10\).05](http://dx.doi.org/10.14505/jemt.v5.2(10).05).

SILAEVA, L.P., 2016. Formation of specialized agricultural production zones / L.P. Silaeva, I.V. Kislova // State and perspectives of development of the agroindustrial complex: Collection of articles of the IV-th International Scientific and Practical Conference. - Penza., 38-45.

VINNICHEK, L., IVANOV, A., 2011. Methodical approaches to the substantiation of the development of distribution and specialization of crop production in the region. *International Agricultural Journal*, 5, 10-14.

VINNICHEK, L., IVANOV, A., 2011. Approaches to the formation of specialized crop production zones at the regional level / L.B. Vinnichek, A.A. Ivanov // Territorial and sectoral division of labor in agro-industrial production: Collection of scientific works of the international scientific-practical conference. Russian Agricultural Academy, 92-106.

YANG, C.-H., WU, L., LIN, H.-L., 2010. Analysis of total-factor cultivated land efficiency in China's agriculture. *Agric. Econ. - Czech*, 56, 231-242.