



PAPER ID: 11A06K



STATE AND EFFECTIVENESS OF THE RUSSIAN ENTERPRISE OF HORTICULTURE PRODUCTION

Konstantin Ternovykh ^{1*}, Natalia Leonova ², Victoria Malitskaya ³, Maria Chirkova ⁴, Alena Markova ¹

¹ Department of Farm Production Management and Entrepreneurial Business in Agro-Industrial Complex, Voronezh State Agrarian University named after Emperor Peter the Great, Voronezh, RUSSIA.

² Department of Economics in Agro-Industrial Complex, Voronezh State Agrarian University named after Emperor Peter the Great, Voronezh, RUSSIA.

³ Department of Accounting and Taxation, Plekhanov Russian University of Economics, Stremyannyy per., 36, 117997 Moscow, RUSSIA.

⁴ Department of Accounting and Audit, Voronezh State Agrarian University named after Emperor Peter the Great, 394087 Voronezh, Michurina, 1, RUSSIA.

ARTICLE INFO

Article history:

Received 05 August 2019
Received in revised form 18 December 2019
Accepted 08 January 2020
Available online 21 January 2020

Keywords:

Horticultural crops;
Intensive gardening;
Horticulture farming enterprise; Fruit crops;
NPK Fertilization;
Orchards and berry plants; Horticulture effectiveness.

ABSTRACT

The horticulture effectiveness depends on its species composition. Most Russian region, natural conditions do not allow growing fresh vegetables and fruits all year round. Winter varieties of apples are of great importance. From the gross collection of CJSC Agrofirma named after 15 Years of October, the main share (48%) belongs to five winter varieties. A high planting material cost and cultivation technologies predetermine a large production cost. Agrofirma makes 15 treatments a year with Serbian modern complex fertilizer, providing growth stimulation, root system development and increase productivity. At ZAO Agrofirma, fertilizers for planting fruit crops in intensive cultivation technologies are applied to the entire garden area (between crops) and under fruit trees. Sparingly soluble forms of phosphate fertilizers (phosphorite flour), citrate-soluble (precipitate, defluorinated phosphate, thermophosphate) are added to the period of pre-planting soil preparation, and water-soluble (superphosphates) for the main fertilizer and fertilizing. Doses adjustment and the nutritional conditions control, the leaf diagnostics method is used. Agrofirma considers the most efficient in-line technology for harvesting and transporting apples from the orchard. It increases in labor productivity by 1.5–2 times, increases the output of standard products 1.5–2 times (10–15%). The technology includes five operations: loading rye containers, transporting it to the garden, picking fruits, and transporting and unloading containers with fruits. All of them are performed in a single cycle, one after another without time gaps.

Disciplinary: Modern Fruit Science, Economic and Management Science (Enterprise Economic and Management).

©2020 INT TRANS J ENG MANAG SCI TECH.

1. INTRODUCTION

Horticulture is one of the most important sectors of agriculture, the products of which are used both fresh and as raw materials for canning, wine-making, and other industries. Despite modern methods of processing and storage of fruits, this industry can satisfy the needs of Russian people in fruit and berry products only by 40-45%. The lack of a domestic market with quality fruits and berries forced agricultural enterprises to take measures to maintain a stable situation in the agricultural sector of the region [8].

It should be noted that at the present stage, which is characterized by the aggressiveness of the influence of the external environment of the enterprise's functioning and the ongoing sanctions of Western countries, the specialized horticultural enterprise ZAO Agrofirma named after 15 years of October has to produce and sell products from other industries, including competing ones with the horticulture industry. In particular, the enterprise has developed the production of grain and industrial crops, the cultivation of pedigree cattle. But the horticulture industry is still leading. In the structure of commercial products for 2013–2017 the proceeds from the sale of pome fruit, stone fruit, berries, as well as products of their processing amounted to over 60%, of which 53% fall on pome fruits and about 5% on berries [1, 2, 5].

The condition for effective gardening is the creation of highly productive intensive gardens. Currently, the reproduction of orchards and berry plants at the enterprise is constrained by the insufficient production of high-quality planting material. There is a substantial lack of seedlings of a certain pedigree and varietal composition on dwarf rootstocks and new promising seed and stone varieties. Also, seedlings on the market do not meet the requirements of intensive gardening. Therefore, many specialized horticultural enterprises, including and CJSC "Agrofirma named after 15 years of October" are moving to the cultivation of high-quality planting material both for their use and for sale. At the same time, the requirements for the selection of planting material are taken into account: high frost resistance, good rooting, resistance to diseases and pests. Applied modern technologies for the production of apple seedlings in the plant nursery provide branched plantings with a laid generative sphere, the output of seedlings of the highest quality categories, guaranteeing the onset of commercial fruiting of apple trees in the garden for 4–5 years after planting; growing apple trees with specified parameters for laying intensive gardens of various types. In CJSC Agrofirma named after 15 years of October, in recent years the volume has been increased to 872 thousand units. pome seeds and 147 thousand pcs. shrubs, which allows increasing the garden area by 800 ha [4, 6, 9].

The purpose of the study is to develop scientific and practical recommendations for improving the economic efficiency of horticulture production.

2. MATERIALS AND METHODS

The degree of validity of scientific and applied provisions, conclusions and recommendations presented in this article is confirmed by the use of the materials of the Federal State Statistics Service of the Russian Federation, the territorial body of the Federal State Statistics Service in the Lipetsk Region, annual reporting forms of CJSC Agrofirma named after 15 years of October in the research process Lipetsk region, materials of legal reference and electronic media, as well as periodicals and personal observations of the author. The reliability of the research results is ensured by the application of general scientific and special methods of scientific knowledge.

3. RESULTS AND DISCUSSION

Based on the performance indicators of horticultural enterprises in the Lipetsk Region, it was established that the CJSC Agrofirma named after 15 years of October, located in Lebedyansky District, is one of the most advanced that provides the largest share in the production of fruit and berry products in the region.

This enterprise has gone from a pilot-demonstration farm to the Troekurovsky state farm, and during the reform period, the state farm, like most other horticultural enterprises, adopted the status of an agricultural company, which over the past few decades has grown and become one of the largest not only in the Lipetsk region but and in the Central Black Soil Region, having established itself as a reliable supplier of high-quality and environmentally friendly horticultural products.

For the analyzed period, the total area of pome and stone fruits with was 1589 ha, 125 hectares of berries. From 2013–2017 the area of intensive gardens with drip irrigation increased by 430 hectares and reached 521 hectares, which indicates the desire of the enterprise management to develop horticulture in the innovation and investment direction (Table 1). Moreover, as part of the horticulture development program for the period 2014–2020. In the agricultural company, the laying of intensive orchards and berry plants is planned to be increased to 1026 ha and production and processing volumes to 30 thousand tons of fruits and berries.

Table 1: The area of plantations in CJSC "Agrofirma named after 15 years of October", ha

Types of plantations	2013	2014	2015	2016	2017
Pomegranate (apple, pear, quince)	1911	1518	1297	1174	1589
including intensive type gardens	91	177	289	289	521
Shrub berry berries (raspberries, currants, gooseberries, chokeberry)	54	82	86	86	125
Wild strawberry	-	8	8	36	39
Other plantings	32	47	90	68	56
including nurseries of fruit and berry plantations	32	47	90	68	56

The additional commissioning of intensive orchards and berry plants increased the cost of planting them by 94.4 million rubles, respectively, there was an increase in the cost of caring for perennial plants by 42.7 million rubles, including 32.5 million rubles for intensive gardens (Table 2).

Table 2: The cost of laying and caring for perennial plantings in CJSC "Agrofirma named after 15 years of October", thousand rubles

Types of plantations	2013	2014	2015	2016	2017
tree planting costs					
Pome fruits - total	27833	52582	68937	-	122200
including on 1 ha	14.56	34.64	53.15	-	86.77
intensive type gardens	18855	52582	68937	-	122200
including on 1 ha	207.20	297.07	238.54	-	234.55
Shrub berry	2646	8060	8633	-	4416
Wild strawberry	-	3616	-	-	4416
Tree care costs					
Pome fruits - total	11479	18542	29254	79106	54131
including on 1 ha	6.01	12.21	22.55	67.38	38.43
intensive type gardens	3990	9128	15797	64963	36467
including on 1 ha	43.85	51.57	54.66	224.78	69.99
Shrub berry	242	1497	1293	1674	1405
including on 1 ha	4.48	18.26	15.03	19.46	11.24
Wild strawberry	-	28	-	-	535
including on 1 ha	-	3.50	-	-	13.72

It should be noted that the quality and timing of the sale of produced fruits and berries had a significant impact on the functioning of the analyzed enterprise. This is due to the specifics of the organization of entrepreneurial activity in horticultural enterprises. Horticultural products belong to the goods, firstly, requiring special conditions for their storage, and secondly, objectively having high prices in winter and spring.

The agricultural firm pays special attention to the quality of products, the proper organization of storage contributes to the improvement of which allows prolonging the season of consumption of fresh fruits and berries in the winter-spring period. At the same time, specially equipped warehouses for storing apples, built by the German company Plattenhardt + Wirth, create a special microclimate and gas environment, which ensures a fresh appearance of fruits for a long time, fully preserving all the taste and vitamins [7]. To date, the company has six storage facilities with a controlled gas environment with a capacity of 15 thousand tons of one-time storage. In 2017, about 65% of the fruits and berries were stored, which allowed the continuous process of selling apples in the spring at higher prices, as well as the production of juices from their raw materials.

The effectiveness of the main branch of horticulture depends on the species composition of its structure. When choosing varieties, the fact that the natural conditions of the region do not allow growing fresh vegetables and fruits all year round is also important. In solving this problem, winter varieties of apples are of great importance. In the structure of the gross collection of CJSC Agrofirma named after 15 Years of October, the main share (48%) belongs to five winter varieties (Antonovka 18.02%, Bogatyr 13.61%, Ligol 6.11%, Belorussky Sinap 5.64%, Veteran 5.73%).

Winter varieties are the main ones when laying and selling in the winter, as well as the main raw materials for the production of juices of the "Beautiful Sword" line. Summer varieties are used for making mashed potatoes.

In our opinion, the company should pay special attention to the variety structure, removing varieties with low productivity and inefficient production lines from the garden turnover.

To expand the range of products Agrofirma named after 15 years of October, CJSC, in addition to apples, grows currants, strawberries, raspberries, and Aronia, which are used in the production of juices, jams, mashed potatoes produced under the Beautiful Sword brand. In the agricultural company, the planting of fruits and berries is carried out using elite planting material. The high cost of planting material and cultivation technologies predetermine such a large cost of production. So, the unit cost of production at ZAO Agrofirma named after 15 years of October is as follows: Aronia - 1037.86 rubles/cent, apples - 1148.29 rubles/cent, strawberries - 3903.95 rubles / cent, currants - 4385, 93 rubles/cent, raspberries - 18,924.16 rubles / cent [7].

We note that the main suppliers of plant protection products and fertilizers to the Russian market until 2014 were European countries, with which cooperation with the onset of the crisis was difficult. This gave an impetus to the development of domestic production of analog products with the equal active ingredient, and the missing volume - for imports from China, Serbia. CJSC Agrofirma named after 15 years of October makes 15 treatments a year with modern complex fertilizer of the Serbian production FITOFERT ENERGY, providing stimulation of growth, development of the root system and increase yield (Tables 3 and 4).

Table 3: The processing scheme of the 1st phenological phase of plants (from swelling of the buds to the formation of the ovary) in ZAO Agrofirma named after 15 years of October

Phenological phase	Treatment	Purpose of treatments
"Mouse ear" SZ	1 treatment Fitofertenergy NPK 5-55-10 start + me (4kg / ha)	Compensation of deficiency of nutrients due to insufficient activity of the root system and stimulation of its development
Start bud isolation D3-E	2 processing Phytofertenergy NPK 5-55-10 start + me (4kg / ha) phytofertenergy NPK2-0-2 bioflex liquid + me (2l / ha) phytofertenergy NPK1-0-0 bormax 20% (1kg / ha) magnesium sulfate (1kg / ha)	Stimulate flowering, reduce stress
Pink bud E-E2	3 processing Phytofertenergy NPK2-0-2 bioflex liquid + me (2l / ha) phytofertenergy NPK1-0-0 bormax 20% (1 kg / ha) phytofertenergy NPK0-5-3 mancine 6% (2kg / ha) magnesium sulfate (1 kg / ha)	Ensuring normal energy metabolism, and reducing the impact of stress (low temperatures, cloudy weather), improving the quality of the flower
The end of flowering, falling petals, the formation of the ovary	4 processing Phytofertenergy NPK2-0-2 bioflex liquid + me (2l / ha) phytofertenergy NPK1-0-0 bormax 20% (1kg / ha) phytofertenergy NPK20-20-20 balance + me (2kg / ha) magnesium sulfate (1 kg / ha)	Reducing the effects of stress, increasing cell division, ensuring good leaf quality

Processing the first phenological phase compensates for the deficiency of nutrients due to insufficient activity of the root system and stimulates its development, and also prevents the effects of stress on the formation of the leaf plate.

Table 4: The processing scheme of the 2nd phenological phase of plants (from the formation of the ovary to the leaf fall) in ZAO Agrofirma named after 15 years of October

Phenological phase	Treatment	Purpose of treatments
Ovary diameter (diameter 7 mm)	5 processing Phytofertenergy NPK 20-20-20 balance + me (4kg / ha) phytofertenergy NPK2-0-0 calcifol 25% (3kg / ha)	Stimulate growth and metabolism, activate enzymes, ensure good quality of the leaf, ensure the laying of flower buds
Hazelnut fruit (ovary diameter 14 mm)	6 treatment Phytofertenergy NPK2-0-0 calcifol 25% (3kg / ha) urea (1kg / ha)	Ensuring normal growth and development of fruits, balanced metabolism
Walnut fruit (ovary diameter 30 mm)	7 Phytofertenergy treatment NPK2-0-0 calcifol 25% (3kg / ha) urea (1 kg / ha); 8 processing Fitofertenergy NPK2-0-0 its max-10% (2kg / ha)	Ensuring normal growth and development of fruits, balanced metabolism, ensuring the processes of photosynthesis, respiration, protein metabolism
Pouring fruit	9 Phytofertenergy treatment NPK2-0-0 calcifol 25% (3kg / ha); 10 treatment (Fitofertenergy NPK0-15-45 finish + me (4kg / ha) Fitofertenergy NPK4-0-0 aminoflex liquid + me (2kg / ha) *	Improving the quality of fruits, reducing the effects of stress (high temperatures)
The beginning of fruit ripening	11 processing Fitofertenergy NPK0-15-45 finish + me (4kg / ha) Fitofertenergy NPK4-0-0 aminoflex liquid + me (2kt / ha)	Improving the color of the fruit. increase in keeping quality. stress reduction
Fruit ripening	12 treatment (Fitofertenergy NPK0-0-5 calcimax 40% (2kg / ha)	Improving the quality of fruits
After cleaning	13 Phytofertenergy treatment NPK0-0-5 calcimax 40% (2kg / ha)	Providing the best quality fruit buds and increasing winter hardiness

In the second phenological phase, ten treatments are carried out that ensure normal growth, fruit development, and improvement of their qualities. And after harvesting, they help maintain the quality of fruit buds and increase winter hardiness.

At CJSC Agrofirma named after 15 years of October, the system of fertilizers for planting fruit crops in intensive cultivation technologies is aimed, first of all, at increasing soil fertility, therefore fertilizers are applied both over the entire garden area (in the row-spacing of crops) and under fruit trees. At the same time, sparingly soluble forms of phosphate fertilizers (phosphorite flour), citrate-soluble (precipitate, defluorinated phosphate, thiophosphate) are added to the pre-planting soil preparation, and water-soluble (superphosphate) - for the main fertilizer and fertilizing.

To adjust the doses and control the nutritional conditions of plants, the leaf diagnostic method is used.

At this enterprise, when cultivating fruit crops, a complex system of machines is used, which allows you to perform work in agro-technical terms, reduce labor costs and get high yields of apples.

Garden care is differentiated depending on the age and type of plantings. It includes soil care in rows and rows, crown formation and pruning, fertilizer, protective measures, garden irrigation.

The first post-landing pruning consists of choosing the main skeletal branches and giving a dominant position to the central conductor. In the year of planting, pruning is not carried out, as it weakens the trees; also, it is unclear which of the branches will be better preserved and will occupy a dominant position [8, 10].

The Agrofirma named after 15 years of October CJSC uses a promising drip irrigation method that requires 30–50% less water than with traditional methods. Drip irrigation provides the flow of water into the root zone of the plant. Therefore, when using this method, crusts do not form on the surface of the earth, that is, there are no obstacles to the respiration of the roots even during irrigation. With drip irrigation, the likelihood of the spread of diseases in the area (especially fungal and pests), as well as rotting of the fruits, is reduced, since the leaves remain dry.

The optimal harvesting dates for fruits from their physiological maturity are considered to be those in which the mass of fallen fruits is less than or less than the increase in the mass of fruits on the tree. In this case, the longest storage time of fruits is ensured with the preservation of taste and marketability.

The Agrofirma named after 15 years of October CJSC considers the most efficient in-line technology for harvesting and transporting apples from the orchard. It provides an increase in labor productivity by 1.5–2 times, increases the output of standard products by at least 1.5–2 times (by 10–15%). The technology includes five operations: loading empty containers, transporting them to the garden, picking fruits, and transporting and unloading containers with fruits. All of them are performed in a single cycle, one after another without time gaps. The entire technological process is served by nine integrated teams (horticultural and tractor), in terms of their number of personnel they can be described as average.

Because agriculture is seasonal, the company attracts temporary workers during more intense periods of work, as a rule, during the harvest period of pome fruits and stone fruits and berries. For temporary and seasonal nonresident workers housing, food is provided. Temporary workers are paid both in kind and in cash.

Payment for the implementation of the norm for each worker is made in the amount of 750 rubles. with KTU. All employees of the company engaged in trimming, receive a surcharge for

classiness in the amount of 20% of piecework earnings. At the end of the month, a premium of 30% of piecework earnings is calculated for quality garden cutting work, including KTU, but without class. The premium is accrued provided that the norm is not less than 80%.

For the analyzed period, the increase in the wage fund in the whole agricultural company occurred by 27%. The increase in the fund led to an increase in the average monthly wage both in the enterprise and in certain categories of workers. In 2017, the average monthly salary in the enterprise amounted to 34,229 rubles, for gardening workers 21,100 rubles, which is 36% and 25% higher than in 2013.

After analyzing the monetary component of the motivational policy of the enterprise, we believe that for a modern enterprise, the wage system is outdated and does not meet the realities of today.

The focus of the incentive system should be consistent with the tactics and strategies of managing the enterprise, its units, and personnel; incentive payments should be more closely linked to individual and collective outcomes; wage growth relative to labor productivity growth (sales performance) must be regulated by planning objectives; incentive system should be perceived by employees as understandable and fair. It should also be noted that the company needs to develop a single regulation on remuneration for all types of work.

The organizational and economic assessment of the horticulture industry at ZAO Agrofirma named after 15 years of October indicates the instability of the production of fruits and berries (Table 5). In 2017, the gross harvest of horticultural products amounted to 15041 tons, which is 1961 tons less than the level of 2016. This is due primarily to frost during the flowering period. Accordingly, the yield decreased by 1.5 times and amounted to 209.9 kg/ha.

Table 5: Key indicators of horticulture development in ZAO Agrofirma named after 15 years October"

Indicators	Year				
	2013	2014	2015	2016	2017
Gross tax, t	20851	18688	13279	17002	15041
including gross harvest of intensive type gardens, t	-	-	-	8197	13120
Productivity c / ha	252.4	276.6	235.4	311.5	209.9
including productivity of intensive type gardens, kg / ha	-	-	-	283.6	251.8
Area of fruiting stands, ha	826	676	564	546	717
including intensive type gardens	91	177	289	289	521
The cost of laying perennial plantings in total, thousand rubles:	31517	70765	77570	-	126616
including on 1 ha	14.56	34.64	53.15	-	76.90
intensive type gardens	18855	52582	68937	-	122200
including on 1 ha	207.20	297.07	238.54	-	234.55
The costs of caring for perennial plantations in total, thousand rubles	11863	20251	30547	80780	55536
including on 1 ha	6.01	12.21	22.55	67.38	34.07
intensive type gardens	3990	9128	15797	64963	36467
including on 1 ha	43.85	51.57	54.66	224.78	69.99
Labor costs per 1 centner, thousand people - hour.	1.3	1.1	1.4	1.3	1.0
The production cost of 1 centner of products, rub.	612	602	1073	1116	1148
The total cost of 1 centner of products, rub.	991	1308	1545	2249	2110
The selling price of 1 centner of products, rub.	2357	2529	3772	4812	3912
Profit per 1 ha of fruiting plantations, thousand rubles	138.7	145	343.6	362.8	254.9
Profitability level,%	137.8	93.3	144.1	114.0	85.4

4. CONCLUSION

Applied modern technologies for the production of apple seedlings in the enterprise nursery provide branched plantings with a laid generative sphere, the output of seedlings of the highest quality categories, guaranteeing the occurrence of commodity fruiting of apple trees in the garden for 4–5 years after planting; growing apple trees with specified parameters for laying intensive gardens of various types. In Agrofirma named after 15 years of October, in recent years they have increased the volume to 872 thousand units. pome seeds and 147 thousand pcs. shrubs, which allows increasing the garden area by 800 hectares

At this enterprise, when cultivating fruit crops, a complex system of machines is used, which allows you to perform work in agro-technical terms, reduce labor costs and get high yields of apples.

The Agrofirma named after 15 years of October CJSC uses a promising drip irrigation method that requires 30–50% less water than with traditional methods. Drip irrigation provides the flow of water into the root zone of the plant. Therefore, when using this method, crusts do not form on the surface of the earth, that is, there are no obstacles to the respiration of the roots even during irrigation. With drip irrigation, the likelihood of the spread of diseases in the area (especially fungal and pests), as well as rotting of the fruits, is reduced, since the foliage remains dry.

In the Agrofirma named after 15 years of October CJSC, the most effective is the in-line technology for harvesting and transporting apples from the garden. It provides an increase in labor productivity by 1.5–2 times, increases the output of standard products by at least 1.5–2 times (by 10–15%). The technology includes five operations: loading empty containers, transporting them to the garden, picking fruits, and transporting and unloading containers with fruits. All of them are performed in a single cycle, one after another without time gaps. The entire technological process is served by nine integrated teams (horticultural and tractor), in terms of their number of personnel they can be described as average.

Thus, the organization of horticulture production in "CJSC" Agrofirma named after 15 years of October "is characterized by high efficiency. Newly laid gardens allow you to get a high-quality crop and bring it to the consumer with minimal losses and, ultimately, get a steady profit and achieve high-performance indicators from year to year.

5. DATA AND INFORMATION AVAILABILITY

Relevant information can be made available by contacting the corresponding author.

6. REFERENCES

- [1] Tasks of the agricultural department of the Lipetsk region for 2017. Available at: <http://ush48.z4.ru/about/tasks>.
- [2] CJSC "Agrofirma named after 15 years of October". Available at: <http://krasivaya-mecha.ru>.
- [3] Information on the results of the work of the agro-industrial complex of the Lipetsk region for 2016. Available at: <http://www.admlip.ru/economy/industry/agroprom/itogi-raboty-za-2016-god>.
- [4] Information on the results of the work of the agro-industrial complex of the Lipetsk region for 2017. Available at: <http://www.admlip.ru/economy/industry/agroprom>.
- [5] Leonova N.V. (2018). Organizational and economic aspects of the development of Russian gardening. Bulletin of the Voronezh State Agricultural University. Vol. 11, № 1(56):205–213.

- [6] Leonova N.V. (2019). The main directions of increasing the economic efficiency of gardening: dis. cand. econ. Sciences: 08.00.05. Voronezh.
- [7] Minakov I.A. (2013). Strategy for the innovative development of horticulture of the Russian Federation: monograph. Michurinsk: Publishing house of the Michurinsky GAU.
- [8] The current state of the apple market in the world. Available at: http://ikc.belapk.ru/assets/files/issledovaniya/yablok_2015.pdf.
- [9] Territorial authority of the Federal State Statistics Service for the Lipetsk Region. Available at: <http://lipstat.gks.ru>.
-



Professor Dr. Konstantin Ternovykh is Professor, Meritorious Scientist of the Russian Federation, and Head of the Dept. of Farm Production Management and Entrepreneurial Business in Agro-Industrial Complex. His scientific interests are Agricultural Enterprise Planning, Strategic Planning and Analysis of the Agricultural Business.



Natalia Leonova is a Docent, the Dept. of Economics in Agro-Industrial Complex. She is a Candidate of Economic Sciences. Her scientific interests are organizational and economic aspects of horticulture development, economic efficiency of agricultural production



Professor Dr. Victoria Malitskaya is Professor of the Accounting and Taxation Department. She holds Doctor of Economics. Her scientific interests are accounting, analysis and audit of financial assets, consolidated financial statements.



Dr. Maria Chirkova is an Associate Professor of the Accounting and Audit Department. She has a Doctor of Economics degree. Her scientific interests are accounting, analysis and audit in trade, accounting and analysis of bankruptcies



Alena Markova is a Docent, the Dept. of Farm Production Management and Entrepreneurial Business in Agro-Industrial Complex. She is a Candidate of Economic Sciences. Her scientific interests are organization of production and entrepreneurship in agriculture, enterprise planning, business planning
