



## **Targeted Program Management of the Fruit and Berry Sub-Complex of Krasnodar Region**

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### **ABSTRACT**

This article describes the state support tools and mechanisms for a fruit and berry sub-complex of Krasnodar Region based on program and target technologies. The author offer the assessment indicators of support measures' package realization efficiency for a fruit and berry sub-complex of Krasnodar Region. The results of the analysis of efficiency of realization of these measures are also presented, and the economic-mathematical model of measures' influence assessment of the state support on efficiency of a fruit and berry sub-complex development is constructed, as well as calculation of the operating influences with use of regression analysis methods. The main directions for program tools improvement aim the management of the said sub-complex of Krasnodar Region. The means for this improvement are as follows: The means of the purposes and resources validation, restructuring measures of the state support, innovative and investment development, regarding investment of public funds in introduction of innovative development allocated for productivity increase and for decrease in capital intensity.

**Keywords:** Globalization, Targeted Program Management, State Support, Indicator

**JEL Classifications:** G30, Q02, Q18

### **1. INTRODUCTION**

During the modern period of economical development, the success of the regional branch sub-complexes development in many respects depends on their ability to fast adaptation in the changing conditions. For this reason, specifics of economy restructuring processes on the know region-intensive basis were the reason of shift the "center of gravity" of economic growth on regions (Zakharova et al., 2015; Taranova et al., 2015; Novoselova et al., 2015).

Ensuring food security in the conditions of regionalization and under the progressing influence of unstable world economic system becomes one of priority problems of modern Russia. In this regard, problems of ensuring steady reproduction process in agrarian and industrial complex and optimization of the state support instruments are statistician.

### **2. THE MAIN PART**

Stabilization and increase in fruit production is possible only on basis of system approach to its public administration, which effective tool is the program and target method. Relevance of the program use and target method in fruit growing is caused by its feature consisting in discrepancy of the budgetary funds investment period to the period of receiving results (long-term plantings belong to the fixed business assets, and their return begins for the 3-4<sup>th</sup> year after planting) (Egorov, 2012).

Thus the state regulation of branches of agrarian and industrial complex, which is carried out by development and implementation of federal target programs, often faces problems of effective budgetary funds development ratio and achievement of the planned results. Efficiency of a targeted program management in many

respects depends on the correct creation of the interconnected and interdependent “Purpose - Actions – Result” system, which elements in an optimum combination form affect the emergency.

Unfortunately, the existing situation with federal and regional programs financing doesn't allow to realize the “anti-inertial” potential of a program method. According to Pchelintsev development has to go not on the way of mechanical “sequestering” of the existing software package, but on the way of transition from program “only planning” to program control (Pchelintsev, 2004).

At the same time, in the conditions of a new development paradigm – on the one hand the agrarian economy globalization, and on another – under the influence of the crisis factors and economic restrictions, there is a need for an integrated approach. This refers to the solution of systems' social and economic functioning problems of the region based on targeted program management application. Improvement of methodical approaches to the target programs development, mechanisms of their realization and an efficiency assessment is required.

Krasnodar Region possesses all necessary climatic factors promoting cultivation of fruits and berries with high flavoring and commodity qualities. In the territory of the region there are 69 large-scale and average enterprises, and also more than 250 enterprises of small business forms, they all are engaged in the fruits production. In recent years, the areas of gardens has grown in country farms and now make about 8% of total area. The gross production index so far is 2.5%, but in the introduction process of “young” gardens' fructification this figure is growing considerably. The modern intensive technologies, which are actively applied by the gardening enterprises of Kuban, allow systematical increasing of the fruit crops gross collecting. The crop of the “pome” and “kernel” fruits' types in 2013 was the highest of the last 20 years – 284 thousand tons and (Which is 129% to the level of 2012). Introduction of modern technologies allows significant raising of the production from the specified area, so productivity in intensive gardens of an apple-tree makes 40000-45000 k from 1 hectare (from here on c/hectare; c=100 kilos), while in usual gardens the index is 2-3 times less.

The total area of fruit and berry plantings in Krasnodar Region is reflected in Table 1.

The generalizing result of fruit production is the gross collecting, presented in Table 2.

Analyzing the data from Table 2 it should be noted that in farms of all categories the volume of gross fruit and berry production collecting in general increases by 43.9% and makes 388.66 thousand tons: The pome type – 41.3% increase, which makes 295.93 thousand tons; the kernel type – 56.2% increase, making 56.2 thousand tons; the berry – 41.2%, which is 30.44 thousand tons; and the nut bearing – by 3.3 times = 3.18 thousand tons.

Gross collecting of the fruit and berry production in the specialized agricultural organizations in general has grown by 42.8% and made 277.35 thousand tons; the pome type – for 40.7% also made 252.3 thousand tons; the kernel type – for 78.7% also made

24.66 thousand tons. The considerable decrease in gross collecting volumes in the specialized agricultural organizations of berry and nut bearing cultures should be noted; however, the specific weight of these cultures' types is insignificant.

In 2013 indicators of fruits and berries gross collecting of all region (in the agricultural organizations, in farms of the population and in country farms) was above average value of gross collecting for 2009-2012 and also above target value of the state program of agriculture and agricultural production, raw materials and the food markets regulation development for 2008-2012.

Krasnodar Region shows highly productive activities of the fruit and berry production enterprises of for comparison with the average Russian index. Productivity of fruit and berry plantings is presented in Table 3.

**Table 1: The area of fruit and berry plantings in Krasnodar Region, 1 thousand hectares**

Indicator	2011	2012	2013	2013-2011, %
Farms of all categories	44.735	43.522	43.837	97.0
Pome type	23.916	23.168	22.904	95.8
Kernel type	10.61	10.472	10.712	101.0
Berry	5.272	5.299	5.457	103.5
Nut bearing	4.104	3.677	3.826	93.2
Specialized agricultural organizations	26.2	25.117	25.088	95.7
Pome type	18.4	17.737	17.59	95.6
Kernel type	5.5	5.42	5.437	98.8
Berry	0.1	0.114	0.071	75
Nut bearing	2.2	1.755	1.867	84.9

**Table 2: Dynamics of gross collecting of the fruit and berry production in the Krasnodar Region, thousand tons**

Indicator	2011	2012	2013	2013-2011, %
Farms of all categories	270.07	312.03	388.66	143.9
Pome type	209.48	233.92	295.93	141.3
Kernel type	37.26	50.87	58.21	156.2
Berry	21.56	25.41	30.44	141.2
Nut bearing	0.96	0.93	3.18	331.3
Specialized agricultural organizations	194.158	212.51	277.35	142.8
Pome type	179.49	193.38	252.47	140.7
Kernel type	13.8	18.74	24.66	178.7
Berry	0.77	0.28	0.16	20.8
Nut bearing	0.1	0.06	0.06	60

**Table 3: Productivity of fruit and berry plantings of Krasnodar Region, c/hectare**

Indicator	2011	2012	2013	2013-2011, %
Farms of all categories	74.4	87.3	112.6	151.3
Pome type	114.2	132.1	172.4	151
Kernel type	46.1	60.6	75.1	132.9
Berry	41.7	48.9	56.9	136.5
Nut bearing	2.6	2.8	9.1	350
Specialized agricultural organizations	96	109.2	151.4	157.7
Pome type	128.1	145.0	196.9	153.7
Kernel type	33.0	38.7	68.1	206.4
Berry	60.6	37.8	26.7	44.1
Nut bearing	0.5	0.4	0.3	60

The indexes presented in Table 3 show fruit and berry plantings productivity growth by 38.2 c/hectare, including the pome type on 58.2 c/hectare, the kernel type on 29 c/hectare.

Productivity in the specialized agricultural organizations has also considerably increased, especially on the kernel type – more than twice, at the same time on berry and nut bearing cultures were reduced by 55.9% and 40% respectively.

The state policy of fruit growing development is based on the state program “development of agriculture and regulation of the markets of agricultural production, raw materials and food for 2008-2012” which was prolonged till 2020. The program includes the section directed on implementation of actions for long-term plantings creation stimulation, and creation of conditions for fruit growing development (The Resolution of the Government of the Russian Federation of 14.07.2012 No. 717, 2013).

We will consider efficiency of a targeted program management of fruit growing in Krasnodar Region at the first stage of state program realization (2008-2012). The following measures of the state support of fruit and berry sub-complex development are most fully presented: Subsidies for a planting and works on leaving, the subsidized credits, compensation of part of cost of the acquired resources. The main destination of subsidies – assistance to expanded reproduction of plantings and to increase in volumes of production, carrying out high-quality and technological policy (Shichiyakh, 2013).

One of forms of the agricultural producers’ state support is partial compensation of costs for fuels and lubricants acquisition, mineral fertilizers and toxic chemicals of a domestic production. The purpose of the said activity is to compensate the agricultural producers the difference in growth of the consumed resources’ cost and inflation impacts. However, the amount of compensation payments is insignificant; it doesn’t allow to cover a difference of macroeconomic changes and to give support for technological development of branch.

Production efficiency of fruits increased with acceptance of the state program within which the support of agricultural producers is carried out by means of subsidies and compensations. It allows to carry out renovation of long-term plantings and to reduce influence of macroeconomic changes in economy. However, in our opinion, the standard mechanism of the state support efficiency assessment based on determination of branch development rates compliance to program installations and level of the planned indicators performance (indicators) is inefficient. It is connected with that:

- Under the influence of various economic, climatic and other subjective factors control indicators have considerable deviations;
- It is necessary to consider branch features at calculation of dimension of state support. In such branches as fruit growing, for example, it is necessary to consider specifics of reproduction of long-term plantings, i.e., duration of restoration fund formation due to depreciation charges caused by a high rate of inflation, leading to devaluation of this fund (Shichiyakh, 2013).

Now the technique of the state support measures efficiency determination is based on absolute measures, such as increase in the area and gross collecting production, growth of productivity, efficiency etc. This technique demands essential completion: Introduction of the relative economic indicators characterizing growth of production efficiency and development of reproduction processes is necessary.

Rather serious contribution was made in generalization and increasing know region of the state support of fruit growing development by GNU representatives “The North Caucasian zone research institute of gardening and wine growing.” Supplementing the assessment indicators of efficiency of the fruit growing development state support developed by them it is possible to offer the following indicators:

1. Share of the state support in costs for a planting and work on care of them (Table 4).

For the analyzed period (2006-2012), the growth of the state subsidies by 3 times is revealed. It is caused by increase in costs for a planting and supporting works that allows to hold a share of the state support in limits of the planned norm, making 20%, in 2012 – 21.2%. Definition of a share of the state support in joint costs on a planting and works on care of them expressed as a percentage, allows revealing a contribution of the state in support of development of branch.

2. Decrease in expenses due to reduction of cost of long-term plantings.

Allocated for a planting and work on leaving of a subsidy behind them counting on 1 year reduce the cost of long-term plantings which in turn is base for charge of the depreciation considered when forming prime cost of fruit production (Table 5).

For the period from 2006 to 2012 subsidies grew by 63.8%, and planting cost under the influence of various macroeconomic Indicators (inflation, growth of cost of the consumed resources, etc.) doubled. For 2006-2011 the Indicator of decrease in expenses due to depreciation charges gradually decreases – from 63.4% to 36.1% – provided that economic entities over 60% have deficiency of fund of restoration.

3. A gain of gross output production for 1 rub of subsidies, rub/rub (Table 6) (Egorov, 2013).

Calculation of a gross output production gain for 1 rub of subsidies which makes from 0.44 to 0.93 rub, shows that measures of the state support are insignificant and help given to economic entities is inefficient. Each ruble of subsidies has to bring not <1.5 rub of a gain of gross output production.

Calculation of this Indicator considers specific features of branch, which consist in discrepancy of the period of allocation of subsidies and receiving effect from them.

4. Growth of profitability at the expense of measures of the state support in result of decrease in the current expenses and expenses of capital character (Table 7) (Egorov, 2013).

The data in Table 7 show that the growth of productivity, subsidies and expenses for 2006-2012 period. Growth of profitability at the expense of the state support measures in 2012 makes to 37.4%.

**Table 4: Calculation of the indicator “share of the state support in joint costs on a planting and Ukhodny works”**

Indicator	2006	2007	2008	2009	2010	2011	2012	2012-2006, %
Total amount of the subsidies allocated with the state, million rubles	33.8	73.5	70	50.4	56.8	110	130	384
Total amount of costs for planting and supporting works, million rubles	275.2	399.9	430.5	276.1	212.8	352.8	612	222
Share of the state support in costs for a planting and work on leaving, %	12.3	18.4	16.3	18.2	26.7	31.2	21.2	-

**Table 5: Calculation of the indicator of decrease in expenses due to depreciation charges**

Indicator	2006	2007	2008	2009	2010	2011	2012	2012-2006, %
Annual size of depreciation charges, 1 thousand rub/hectare	11.0	11.7	18.0	21.4	22.6	23.8	24.5	205.4
The size of subsidies for a planting and work on care of them to the introduction in fructification, 1 thousand rub/hectare	84	84	84	104	104	104	162.3	163.9
Considering 1 year estimations	7.0	7.0	7.0	8.6	8.6	8.6	13.5	122.8
Decrease in expenses due to depreciation charges, %	63.4	59.8	38.6	40.4	38.2	36.1	55.1	-

**Table 6: Calculation of the indicator of a gain of gross production for 1 rub of subsidies**

Indicator	2006	2007	2008	2009	2010	2011	2012
Gain of gross output, from the plantings which entered fructification in value terms, million rubles	22	66	30.8	35.2	30.8	47.2	51.8
Volume of the budgetary subsidies for a planting and work on leaving, million rubles	33.8	73.5	70	50.7	44.9	110	130
Gain of production of gross output for 1 rub of subsidies, rub/rub			0.91	0.48	0.44	0.93	0.47

**Table 7: Calculation of profitability growth indicator at the expense of a measures package on development fruit growing in Krasnodar Region**

Indicator	2006	2007	2008	2009	2010	2011	2012
Price of realization, rub/c	1301	1267	1497	1249	1335	1410	1520
Prime cost, rub/c	1091	661.4	820	785	890	940	960
Productivity, c/hectare	111	197	199.8	274.5	210	198	185
The size of subsidies for a planting and work on leaving counting on 1 year, 1 thousand rub/hectare	7.0	7.0	7.0	8.6	8.6	8.6	13.5
The size of compensations on the acquired resources of other branches (fuels and lubricants, SZR, fertilizer), 1 thousand rub/hectare	1.395	1.472	1.521	1.575	1.82	2.14	2.32
Profitability taking into account measures of state support, %	28.1	104.9	92.6	67.0	58.9	59.2	58.3
Profitability without measures of state support, %	19.3	91.6	82.6	59.1	50.0	31.8	20.9
Growth of profitability at the expense of measures of state support, %	8.8	13.3	10.0	7.9	8.9	27.4	37.4

The assessment of the state support influence on efficiency of a fruit and berry sub-complex, and calculation of the operating influences are carried out based on system of regression models. For an assessment of efficiency of measures of the state support for the first indicator, we will construct regression model and we will carry out an economical and statistical assessment of its parameters. The equation of regression has the following appearance:

$$Y = -1117.67 + 70.54x - 1.386x^2 + 0.0088x^3$$

where, Y – a gain of gross output in the specialized fruit enterprises; x – the size of subsidies for a planting and work on care of them to the introduction in fructification.

The regression equation allowing to estimate efficiency of measures of the state support and to calculate their expected size on the second Indicator has an appearance:

$$Y = -21.59 - 0.59x + 0.006x^2$$

where Y – growth of profitability of production of fruit and berry production at the expense of measures of the state support;

x – the size of subsidies for a planting and work on care of them to the introduction in fructification (Shichiyakh, 2013).

The generalizing characteristic of the correlation and regression analysis characterizing influence of measures of the state support on efficiency of development of a fruit and berry sub-complex is provided in Table 8.

The elasticity coefficient on the first indicator is equal to 2.6, i.e., at growth of subsidies (measures of the state support) by 1% the volume of gross output on average will increase by 2.6%. This coefficient allows determining the expected size of subsidies and other measures of the state support for achievement of branch development indicators of fruit growing reflected in the state agriculture and the food market development program.

The elasticity coefficient on the second indicator is equal to 0.5, i.e., at growth of size of measures of the state support by 1% growth of profitability of fruit and berry production makes 0.5% points.

The second stage of the state program realization assumes creation of the long-term plantings stimulation and creation of conditions for fruit growing development. Target indicators of fruit growing development within realization of the STATE program are presented in Tables 9 and 10 (The resolution of the Government of the Russian Federation of 14.07.2012 No. 717, 2013).

For realization of the specified actions for creating the long-term plantings, stimulation and creating conditions for the fruit growing development of the following state support types are provided:

- Subsidizing part of the cost of stubbing retired from service and the restoration of old orchards uprooted areas aimed at restoring the garden cycle and fito-sanitary condition of orchards by stubbing retired from service of old gardens, reclamation areas and the renovation of the plantations;
- Subsidizing part of the garden creation cost, and long-term care for the fruit and berry plantings, aimed at supporting creation and long-term care for the fruit and berry plantings until they become marketable fruiting period;
- Funding of research and development mechanical work aimed at the development of new resource-saving technologies of perennial fruit and berry crops cultivation, storage of fruit and berry products. That enhances productivity and quality of products, the development of resource-saving mechanization of labor-intensive processes in the gardening and nursery, new varieties and efficient technologies for cultivation of grapes, holding a clonal selection of autochthonous grape varieties and establishment of lands sufficient for grapes growing. (The resolution of the Government of the Russian Federation of 14.07.2012 No. 717, 2013).

The purpose of the state support for the industry generally is to ensure the expanded reproduction of economic entities' resources,

which is impossible without the optimum combination of private (reassigning part of net income) and public funds (subsidies).

Horticultural enterprises face difficulties in forming the required amount of funds for the implementation of planned renovations. Regulatory need for financial resources for the implementation of the planned renovations in 2013 is 760 thousand Rub/hectare (Ha) of orchards, of which 38.4% (291.8 thousand Rub/Ha) of the source of funding shortages.

The shortage of funds for ensuring planned renovations and expansion of reproduction processes are proved in works of the above mentioned authors from the North Caucasian zone research institute of gardening and wine growing.

The retrospective analysis allows us to define that effect of the measures for implementation of planned renovations established in a state program for 2020 becomes impossible under the influence of the following factors: Decrease in own reproduction opportunities; reductions of volumes of the state support; growth of cost of the consumed resources as a result of macroeconomic price fluctuations (price disparity).

Describing the tools of state support for the poultry industry of Krasnodar Region, the following main areas of adjustment tools and software control of the target fruit and berries sub-complex of the Krasnodar Region:

1. Validation of the purposes and resources of the state program. Within this direction, in our opinion, it is necessary to increase and optimize volumes of the state support; however, rules and requirements imposed by the World Trade Organization (restriction and gradual reduction of measures of state support within "a yellow basket") don't allow to carry out this action. In this regard, a way out from current situation may be the idea and actions recommended by scientific North Caucasian zone research institute of gardening and wine growing on restructuring measures of the fruit growing state support (Egorov, 2013). It is logically correct and promising to revise

**Table 8: Results of the correlation and regression analysis characterizing influence measures of the state support on efficiency of development fruit and berry sub-complex**

Indicator	Productive indicator	Factorial sign	Confidence coefficient	Elasticity coefficient
Gain of production of gross output in value terms	Gain of production of gross output ( $Y$ )	The size of subsidies for a planting and work on leaving to the introduction in fructification ( $x$ )	0.98	2.6
Growth of profitability of production of fruit and berry production (profitability of production)	Growth of profitability of production ( $Y$ )		0.94	0.5

**Table 9: Indicators of the sub-program "Gardening development, support of a planting and care of long-term plantings and vineyards" development**

Indicator	2014	2015	2016	2017	2018	2019	2020
The area of a creating the long-term plantings in the Russian Federation, 1 thousand hectares	6.4	8	7.5	6.4	6.4	6.4	6.4
The area of a creating the long-term plantings in Krasnodar Region, 1 thousand hectares	1.1	1.2	1.2	1.2	1.3	1.3	1.3
Existence of long-term plantings for the beginning of year (gardens) in Krasnodar Region, 1 thousand hectares	34.3	34.4	34.4	34.5	34.5	34.6	34.6
Gross collecting fruit and berry plantings, 1 thousand tons	184	187	190	193	196	201	206

**Table 10: Amounts of financing of the sub-program “Gardening development, support of a planting and care of long-term plantings and vineyards” in Krasnodar Region, thousand rubles**

Indicator	2014	2015	2016	2017	2018	2019	2020	Total
Development of gardening, tea growing, support: planting and care of long-term plantings, all	470526	471496	536636	580992	577212	576017	566717	3779599
Federal budget	0	0	0	0	0	0	0	0
Regional budget, including:	47442.9	47875.2	53580.6	96967.0	96693.9	97169.7	95923.0	535652.3
Subsidies to producers in order to recover part of the costs of care for the bookmark and perennial plants at the expense of the boundary budget	37045.4	37477.7	43183.1	58508.0	58560.9	59321.7	58170	352266.8
Subsidies to agricultural producers for the purpose of cost recovery for stubbing retired from service and the restoration of old orchards uprooted areas due to boundary budget	485.1	485.1	485.1	3690.0	3510.0	3240.0	3150.0	15045.3
Subsidies to agribusiness, ensuring the development of horticulture, for reimbursement of expenses in connection with the stubbing of gardens aged <30 years	100	100	100	10455	9945	9180	8925	38805
Subsidies to agribusiness, ensuring the development of horticulture, for reimbursement of the cost of installing trellis in the gardens of intensive type	2000	2000	2000	2550	2525	2500	2475	16050
Subsidies to agriculture, ensuring the development of horticulture and tea growing, for reimbursement of expenses in connection with acquisition of drip irrigation systems gardens	5327.9	5327.9	5327.9	10815	10815	10815	10815	59243.7
Subsidies to agribusiness in order to recover the costs in connection with the activities for the development of infrastructure in the nursery gardening	1693.6	1693.6	1693.6	5061	5400	5625	5850	27016.8
Subsidies to agriculture, ensuring the development of horticulture, for reimbursement of the costs of breeding activities in the field of horticulture	195.1	195.1	195.1	288	288	288	288	17373
Subsidies to agricultural producers, ensuring the development of horticulture, for reimbursement of the cost of interest on loans for the purchase of agricultural machinery for horticulture	0	0	0	3500	3500	4000	4000	15000
Extrabudgetary funds	423083	423621	483055	484025	480519	478848	470794	3243947

the coefficient ratio between the level of intensity of use acreage towards its increase.

The binding of this coefficient to deficiency of current assets and its adjustment according to indexes deflators would allow to increase partially volumes of the state support and to compensate additional costs of processing, protection and fertilizer of long-term plantings.

In our opinion, possibility of revision of actions for support of domestic producers on subsidizing of a planting costs and care of long-term plantings to the introduction in fructification regarding its goal-setting is also perspective.

2. Reduced capital intensity. The program involves the allocation of funds for the installation of trellis system and drip irrigation systems, which reduces net income by increasing costs of depreciation expense. Thus, subsidies for agribusiness entities, ensuring the development of horticulture, for reimbursement of the cost of installing trellis in the gardens of intensive type and costs in connection with acquisition of drip irrigation systems distort the reproductive processes of significant capital investment to install them. A promising solution to this problem may be innovations in the field of stunted agrotocenozov on no tapestries basis, as well as stimulation of businesses subsidy costs for the purchase of these types of plants. This area can be considered as measures to improve the environment, productivity and reduce the anthropogenic pressure, and therefore, it is

possible to consider the inclusion of these measures in the “green basket.”

### 3. CONCLUDING REMARKS

With increasing international political and economic pressure on the Russian economy, including the markets of agricultural products, increase the level of state support for the industry agro-industrial complex and is the only “life” necessary to stabilize the economy of agricultural production and ensure the reproduction processes of its branches.

Develop and validate economic and mathematical model evaluation of the effectiveness of state support of a fruit sub-complex of Krasnodar Region, based on the revised criteria of optimality and limitations, chief among which is the balance of objectives, resources and the resulting parameters. Optimizing the portfolio of projects and programs in accordance with priorities, promoting the integration process of planning, monitoring and controlling the effectiveness of achieving the targets of development of fruit growing in the Krasnodar Territory, as well as the evaluation of the effectiveness of its implementation should be based on the reproductive approach.

Summing up, it should be noted that the effective combination of territorial and sectorial management program-target planning

ensures the development of the reproductive processes in fruit growing, however, in this case, the calculation of the volume of state support should come from the planned level of reproduction processes, providing the benchmarks of developed programs.

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