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ISSUES OF ECONOMETRICAL ASSESSMENT OF FACTORS AFFECTING FRUIT PRODUCTIVITY IN HORTICULTURAL FARMS

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Annotation: The article examines the impact of resource and natural-climatic conditions on fruit yield grown on farms specializing in horticulture in Akdarya district of Samarkand region. Based on the initial data, the factors affecting productivity were developed and analyzed by a regression model in the form of a linear function.

Keywords: correlation, regression, multivariate correlation, multivariate regression, multivariate analysis, determination.

It is necessary to accelerate the development of all sectors of agriculture in the country, including fruit and grape growing, increase soil fertility, increase fruit and grape yields, improve product quality and preserve them in the off-season to fully meet the demand of our people for fruit and grape products.

Samarkand region, like Fergana, Tashkent and Andijan regions of the country, is one of the leaders in the production and processing of fruit and berry products. The region accounts for 37.9 thousand hectares or 11.9% of the country's gardens (2018). According to the Samarkand regional department of statistics in 2018, the area of fruits and berries in the region amounted to 37204.3 hectares. Bulungur (orchards 5249.8 ha), Jambay (4428.7 ha), Samarkand (4007.9 ha), Urgut (2407.8 ha) and Taylak (1691.6) districts of the region specialize in fruit and vegetable growing. Studies show that horticulture is developed in Nurabad (4838.6 ha), Pastdargom (3685.7 ha), Aqdarya (2145.5 ha) and Ishtikhon (1361 ha) districts of the region.

Economic efficiency of horticulture - the productivity of horticultural crops, the development of a product per unit of labour, its quality and price, the geographical location of horticultural areas, favourable economic and natural conditions, as well as the area of orchards on specialized farms, product specialization and industry. will depend on innovation.

Decree of the President of the Republic of Uzbekistan dated June 17, 2019 PF-5742 "On measures for the efficient use of land and water resources in agriculture" demand for the product in the domestic and foreign markets, the need to ensure that profitability is the main criterion.

The future efficiency of fruit production in the region's horticulture is largely determined by the development of the fruit processing industry following the requirements of a market economy.

Today, horticulture is one of the priorities of the agro-industrial complex of Samarkand region. There are favourable natural and climatic conditions, sufficient labour resources, experience and traditions of the local population to produce competitive products. Many areas have unique soil and climatic conditions for industrial gardening.

Based on the above, one of the important tasks in the complex development of horticulture in the regions remains the study of factors affecting fruit yield.

Issues of studying the theoretical and practical aspects of the organization, management and efficiency of fruit and vegetable growing and viticulture in the country X. Burxonov, M. M. Mirzaev, Ch.Murodov, F. Nazarova, U. P. Umurzoqov, X. S. Xushvaktov, E. I. Ergashev, U. S. Muhiddinova, M. Rakhmatov, reflected in the scientific work of A.S Khodjaev. Economist B.Berkinov and others studied the scientific-methodological and methodological basis for the development of models of activity and development of farms. At the same time, econometric models have been developed to analyze and evaluate the financial stability of farms and the efficiency of the use of production resources.

One of the most important features in the development of the economy is the importance of determining the impact of factor indicators on the performance of a particular industry.

The purpose of the multifactor correlation-regression analysis is to create a multifactor econometric model, to determine the impact of each of the factors under consideration, as well as to determine their overall relationship to the results obtained and to make predictions based on the developed econometric model.

The study examined the effect of factors such as the amount of organic fertilizer applied to the garden area, the amount of mineral fertilizer applied to the garden area, the amount of

water used, temperature, precipitation, relative humidity and soil fertility (score quality) on the average yield per hectare.

An overview of the econometric model of the issues under consideration is as follows:

$$Y = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5 + a_6x_6 + a_7x_7 \quad (1)$$

Based on the problem, the following were selected as the factors influencing the average yield (Y, quintals per hectare, outcome factor) from 1 hectare of garden area (by farms):

- The amount of organic fertilizer applied to 1 ha of garden area, quintals per hectare (x_1);;
- Amount of mineral fertilizer applied to 1 ha of garden area, quintals per hectare (x_2);
- The amount of water consumed per 1 hectare, $м^3$ (x_3);
- temperature, C^0 (x_4);
- precipitation, mm (x_5);
- relative humidity, % (x_6);
- soil fertility (score quality),% (x_7);

In Samarkand region, the first frost of autumn falls on October 15-20, and the last frost of spring falls on the third decade of March. The duration of the growth period of heat-loving plants is 205-210 days, the sum of the average daily temperature is 3870 ℃, and the amount of precipitation during the year is 300-380 mm.

The duration of frost-free days, the sufficiency of effective temperatures, the presence of artificial irrigation in dry and hot summers and almost no precipitation in summer allow the cultivation of agricultural crops, regardless of the duration of the growing season.

Akdarya district, one of the districts specializing in horticulture, in 2018 produced 28.6 thousand tons (8.5%) of the total 333.9 thousand tons of horticultural products grown in Samarkand region, of which 48.4% fell to the share of farms.

The area of gardens in Akdarya district for all categories of farms in 2018 amounted to 2145.5 hectares. According to 2018 data, there were 1,200 farms in Akdarya district. The total area of land allocated to these farms is 25,550 hectares, of which 19,469 hectares or 76.2% are arable lands. 437 farms in the district are engaged in horticulture, and 44 farms are

engaged in viticulture. The total area under horticultural farms in the district is 1,820 hectares, and on vineyards - 155 hectares. The area of orchards on horticultural farms was 1240 hectares, the area of vineyards was 133 hectares, which was 6 and 111 hectares, respectively, on viticulture farms. The area of orchards per horticultural farm is 2.8 hectares, and 0.14 hectares in viticulture farms.

The problem was solved using the STATA program. In the process of solving the problem, 182 fruit farms operating in Akdarya district were selected.

According to the results of calculations in the STATA curriculum, the regression equations look like this:

$$\hat{y} = 91{,}94 + 0{,}052x_1 + 0{,}524x_2 + 0{,}074x_3 + 0{,}195x_4 - 1{,}154x_5 - 0{,}309x_6 + 1{,}039x_7$$

This multi-factor econometric model shows that if the amount of organic fertilizer applied per hectare of garden area increases by (x_1) per quintal, the average yield (Y) per 1 hectare of garden area will increase by 0.052 quintals. If the amount of mineral fertilizer applied per 1 hectare of garden area (x_2) increases by 1 quintal, the average yield (Y) per 1 hectare of garden area will increase by 0.52 quintals. If the soil fertility is increased by one unit, the average yield (Y) per 1 hectare of garden area will increase by 1.04 quintals. An increase in the amount of precipitation (x_5) by 1 mm can reduce the average yield (Y) per 1 hectare of garden area by an average of 1.2 quintals, just as an increase in relative humidity also leads to a decrease in yield.

The resulting coefficient of determination R^2, which represents the amount of the coefficient, was 0.7921. This indicates that the resulting factor is sufficiently strongly correlated with the selected factors, i.e., the change in average yield from the garden area is 79.21% due to factors included in the multi-factor econometric model $(x_1, x_2, x_3, x_4, x_5, x_6, x_7)$. The remaining 20.79 shows the effect of factors not taken into account.

The use of the econometric model in the analysis of available resources and natural and climatic conditions in the cultivation of agricultural products gives good results.

A distinctive feature of fruit growing is that perennial seedlings are associated with environmental conditions. As a result of the study, we believe that the following measures should be taken to develop horticulture in the region:

- Creation and introduction into production of intensive orchards with the use of high-demand trees, stunted, semi-stunted and medium-height vegetative propagated stocks, high-yielding varieties in the existing farms specializing in horticulture in the district; it is necessary to introduce the development of new technologies for fruit growing.

- Placing seedlings in optimal climatic conditions; introduction of soil systems, provision of mineral nutrients and moisture; introduction of an integrated system of protection against pests and diseases; timely transplanting seedlings.

- Comprehensive mechanization of production, storage and processing of fruit products; development of vehicles, road network; creation of a modern base for fruit storage and processing; market infrastructure development.

- Introducing an ecologically clean system to protect trees from abiotic and biotic stresses, taking into account the weather, based on monitoring the development of pests and the functional state of plants.

In summary, soil fertility has a strong impact on fruit yield on district farms. This, in turn, indicates the need to achieve the maximum productivity potential of agricultural lands. To do this, it is necessary to increase soil fertility by preventing the degradation of agricultural lands and sharply reducing it.

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