

# Assessment of the competitiveness of agricultural production enterprises

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**Abstract.** The clash of interests of producers of products, works and services in the struggle for profit is a natural process in a competitive environment. Competition as a fundamental characteristic of the market economy has a significant impact on the economic activity of the enterprise, forcing it to strive for superiority over its competitors. In modern economic conditions in Uzbekistan, competition is increasing. As a result, business leaders are constantly searching for new tools for managing enterprises, organizations, factors and levers to increase their competitiveness. The most correct choice of the company's assortment policy serves as a kind of guarantee that profitable opportunities will not be missed. In this regard, the problem of effective management of the product assortment of manufacturing enterprises is always relevant. The article considers a list of issues that affect the essence and importance of assortment management in a production enterprise, suggests measures to improve the management of the product assortment and assesses their effectiveness. The purpose of this article is to develop measures to improve the management of the product assortment on the example of an agricultural enterprise. The object of research is JSC "Aggregate plant". The main activity of the plant is the production of agricultural machinery, components and parts for agricultural machinery and oil pumps.

## 1. Introduction

The history of the company under study begins in March 1955, when the production of earth-pumping units was started, and then the production of sprinklers. In connection with the determined profile, the plant was named the Tashkent plant of irrigation engineering. In 1959, the plant was redesigned for the production of tractor and agricultural machinery.

In 1961, production of self-propelled chassis for two-row cotton harvesters was mastered, and since 1964 gearboxes for agricultural machines and combines. In 1968, the plant began mass production of a 50-horsepower tractor T28-X4. It allowed to establish the production of the world's first four-row cotton harvesters "Uzbekistan".

Since 1972, the plant was renamed the Tashkent aggregate plant. Since 1980, the production of units for heat treatment of workpieces has been introduced, a line of SNC furnaces and a new automatic electroplating line have been installed and introduced. Until the 90's, the plant's production was specialized in the production of individual units and aggregates, such as front and rear axles for universal tilled and cotton-growing tractors, universal and special reducers for various machines and mechanisms, and spare parts for them, supplied to the republics of the former USSR.



Currently, JSC “Tashkent aggregate plant” specializes in the production of agricultural machines (sprayers, cotton seeders, mowers), manufactured jointly with the company “AGRIMONDO” (Italy) and the company “KUHNN” (France). The plant also produces machines for soil preparation (plows, rotary harrows and deep-tillers) and rear-mounted rotary mowers together with KUHN. The plant's products include, in addition to agricultural machinery, gear pumps NSh-10, NSh-32, NSh-50, gear motors, general industrial gearboxes, various universal and special gearboxes. Next in line is the production of water pumps of various configurations. The plant produces a large assortment of consumer products that are in constant demand not only in Uzbekistan, but also abroad. Currently, the company exists in the form of an open joint-stock company.

## 2. Methods

The analysis methods used are the main ones for controlling the organization's assortment. We will study in more detail the available areas of analysis of the product portfolio.

The importance of an organization's assortment policy plays an important role in a market economy. A significant impact on the results of economic activity is expressed by the assortment and structure of production and sales of products.

Timely updating of the assortment of products (services) taking into account changes in market conditions is one of the main indicators of an organization's business activity and its competitiveness.

When developing the assortment and structure of output, an enterprise should take into account, on the one hand, the demand for the types of products provided, and, on the other, the most effective use of labor, raw materials, technical, technological, financial and other resources available to it.

The system of product assortment development includes the following important points:

- establishing prospective and current needs of consumers;
- assessment of the level of competitiveness of manufactured or planned products;
- product lifecycle research and making timely decisions;
- measures to introduce new, more improved types of products and exclude obsolete and economically inefficient products from the production program;
- assessment of economic efficiency and risk of changes
- assortment of products produced.

The combined characteristic of changes in the product assortment is given by the coefficient of the same name, the level of which is determined as follows:

$$Cas = \text{Volume of products taken into account} / \text{Basic volume of production (sales) of products (1)}$$

Analysis of the product assortment of JSC “Aggregate plant” shows the following indicators. The assortment width is represented by five product groups:

- cotton sprayers;
- cotton seeders;
- rotary mowers;
- spreader;
- subsoilers.

This assortment of product groups is due to the specialization of JSC “Aggregate plant” and is, as a rule, a standard assortment for agricultural orientation. The situation is somewhat different with regard to the depth of the assortment. Since the organization produces mechanisms of only one brand, outdated brands are removed from production, the depth of the product assortment cannot be analyzed. Thus, the saturation of the product assortment is characterized by the presence of five groups in it. The assortment can be described as harmonious due to the fact that all products are the result of a single technological process, are sold in the same markets and through a common sales network.

In order to analyze the work with the assortment at the enterprise of JSC “Aggregate plant”, we will calculate a number of coefficients and draw conclusions based on the data obtained.

Completeness coefficient is a ratio of the number of goods varieties on sale to the number of products provided for by a contractual obligation (assortment list). The completeness coefficient is calculated using the formula:

$$KC = QA/Q_n \quad (2)$$

where  $Q_a$  is the actual number of product varieties at the time of verification;

$Q_n$  is the number of product varieties provided for in the mandatory assortment list.

Along with the correct formation of the assortment, an important task is to ensure its stability.

The sustainability coefficient (SC) allows to meet the demand for the same product.

The sustainability coefficient is the ratio of the number of species, varieties and product names that are in stable demand among consumers to the total number of species, varieties and product names of the same groups. The coefficient of stability is calculated using the formula:

$$KS = (Q_{a1} + Q_{a2} + \dots + Q_{an}) / (QN \times n) \quad (3)$$

where  $Q_{a1}, Q_{a2} \dots$

$Q_{an}$  is the actual number of product varieties at the time of individual inspections;

$QN$  is the number of product varieties provided for in the mandatory assortment list;

$n$  is the number of checks.

The novelty of the assortment is the replacement of products on sale with products with higher consumer properties.

The novelty coefficient is determined by the formula:

$$KN = N/Q_a \quad (4)$$

where  $N$  is the number of new product varieties on sale;

$Q_a$  is the actual number of product varieties available for sale.

We will calculate the coefficients based on the results of three checks. The results of calculating the completeness of the product assortment are presented in table 1.

**Table 1.** Completeness of the product assortment of JSC “Aggregate plant”.

Name	Number of product varieties and assortment completeness								
	01.05.2019			01.07.2019			01.09.2019		
	$Q_a$	$Q_n$	KC1	$Q_a$	$Q_n$	KC2	$Q_a$	$Q_n$	KC3
Cotton sprayers	5	10	0.5	8	10	0.8	8	10	0.8
Cotton seeders	5	10	0.5	8	10	0.8	8	10	0.8
Rotary mowers	7	12	0.58	10	12	0.83	10	12	0.83
Spreader	8	13	0.62	11	13	0.85	13	13	1
Subsoilers	7	9	0.77	9	9	1	9	9	1

The completeness of the products assortment does not correspond to the declared list of the plant, but for certain commodity items (fertilizer spreaders, deep loaders) it remains stable and the completeness coefficient is high enough for the finished product.

The results of calculations of the assortment stability selected products are presented in table 2. The sustainability coefficient for all the names of the studied products is less than one, therefore, it can be recognized that the assortment is unstable. The novelty coefficient can be assumed to be zero, since there were no new types of products received during the inspection, according to these groups. The policy of updating the assortment should be rational, since constant and increased updating of the

assortment for JSC “Aggregate plant”, as a manufacturer and seller, is associated with certain costs and risks, for example, new products may not be in demand.

**Table 2.** Stability of the product assortment of JSC “Aggregate plant”.

Name	Number of product names based on results			Number of products in the list	Assortment sustainability
	01.05.2019	01.07.2019	01.09.2019		
	Qa1	Qa2	Qa3		
Cotton sprayers	5	8	8	10	6.3
Cotton seeders	5	8	8	10	6.3
Rotary mowers	7	10	10	12	6.75
Spreader	8	11	17	13	8.31
Subsoilers	7	9	9	9	8.33

Table 3 shows the calculation of the cost of production of JSC “Aggregate plant”. The main production costs are material costs, direct labor costs, indirect costs of materials related to production, and overhead costs for production purposes.

The table shows that the share of material costs prevails for all types of products. For example, for the OVH-600 Sprayer the specific weight of material costs was 74 %, for the SChH-4B cotton seeder 77%, and for the KIR 1.5 rotary mower 87%, when other costs are from 4 to 9%.

According to the table, the most cost-effective product of the plant is the OVH-600 sprayer. Its profitability is 5 % higher than other products. This is achieved by saving labor costs, it is two times less than the SChH-4B cotton seeder. The company should improve cost accounting and control, save labor and raw materials costs.

**Table 3.** Calculation for the main types of products by JSC “Tashkent aggregate plant” for 2019 (thousand soums).

№	Cost items	OVH-600 sprayer		SChH-4B cotton seeder		KIR 1.5 rotary mower	
		cost	%	cost	%	cost	%
		1.	Direct material costs	3059839	74	2005261	77
2.	Direct labor costs (total)	174873	4	216752	8	169712	4
	including the basic salary of production workers	122632		152000		117043	
	social security deductions (24%)	29432		36480		28090	
3.	Indirect costs of materials related to production	178588	5	94543	4	115181	3
4.	Indirect labor costs related to production	389407	9	184752	6	73737	2
5.	Production overheads (total)	361257	9	114633	5	164637	4
6.	Total production cost	4163964	100	2615941	100	4010462	100
7.	Necessary income	836036		384059		589538	
8.	Contractual (free) wholesale (selling) price without VAT	500000		3000000		4 600000	
9.	Contractual (free) wholesale (selling) price with VAT	6000000		3600000		5 520000	
10.	Profitability		20		15		15

Note: 1 ruble is equal to 145.27 Uzbek soums.

Table 4 shows the factors that affect the price of one type of enterprise product (the KIR-1.5 rotary mower). The analysis showed that the main ones are material costs, which range from 75% to 78%, which is associated with the delivery and transportation of raw materials, materials and semi-finished products. There is an increase in labor costs, in 2019 compared to 2018, they increased by 22.5 times.

For 2017 – 2019, the cost of this product increased to 90%, and the profit decreased to 10%. The systematic increase in prices for raw materials also contributed to the increase in the cost of production. Price increases are taking place in the economy of Uzbekistan. The company is recommended to improve contractual relations with suppliers in the direction of reducing prices for purchased raw materials. It is also very important to improve the quality of products. High-quality products will always be in high demand, and this can increase the volume of sales and justify high prices.

**Table 4.** Formation of wholesale prices for the products of the enterprise (thousand soums).

№	Cost items	2017		2018		2019	
		KIR 1.5 rotary mower	price structure (%)	KIR 1.5 rotary mower	price structure (%)	KIR 1.5 rotary mower	price structure (%)
1.	Direct material costs	3487195	75.8	3724196	74.5	4620460	77.7
2.	Direct labor costs (total) including the basic salary of production workers	169712	3.7	169712	3.4	207000	3.5
	social security deductions (24%)	117043		117043		144000	
		28090		28090		36000	
3.	Indirect costs of materials related to production	55181	1.2	62852	1.3	77328	1.3
4.	Indirect labor costs related to production	133737	2.9	160550	3.2	175028	2.9
5.	Production overheads (total) including depreciation	164637	3.6	229 450	4.6	275628	4.6
		115246		160615		192940	
6.	Total production cost	4010462	87.2	4346760	86.9	5355444	90.0
7.	Necessary income, profitability	589538	12.8	653240	13.1	594556	10.0
8.	Contractual (free) wholesale (selling) price without VAT	4600000		5000000		5950000	
9.	Contractual (free) wholesale (selling) price with VAT	5520000		6000000		7140000	

Note: 1 ruble is equal to 145.27 Uzbek soums.

Analysis of production costs shows that in the process of manufacturing products, a lot of raw materials go to waste: metal shavings, pieces of plastic and other various wastes, which also reduce the efficiency of production. By recycling waste or selling it, the organization can use raw materials more efficiently and, accordingly, cover material costs.

### 3. Results

Management of the product assortment of a manufacturing enterprise ensures that the appropriate services of the organization control, analyze and make management decisions in the field of marketing, sales and production in order to adapt the assortment to the needs of consumers. Assortment policy of an enterprise is the art of making decisions on a specific product unit, product group, and on the entire assortment as a whole in order to achieve the organization's assigned goals. To improve the assortment policy of the enterprise is essential: increase sales by optimizing the assortment structure; ensure the growth of inventory turnover; achieve a competitive advantage due to a more interesting assortment; strive to enter new markets; reduce production costs associated with the assortment structure; create a company image by positioning assortment product units.

In the course of studying the assortment policy of the company we identified two main problems of assortment management:

- The needs of consumers are changing rapidly, so the organization has to constantly update its assortment, and this requires additional resources.
- Tough competition leads to the fact that the new product put on the market does not have time to recoup the investment in its production and promotion.

The organization does not have an established assortment management system due to the complexity of forecasting changes in customer demand and the lack of methods for optimizing the assortment.

To improve the process of managing the product assortment of JSC "Aggregate plant", a set of measures is proposed, which are shown in the table.

**Table 5.** Set of measures aimed at improving the management of the JSC "Aggregate plant" product assortment.

Methods of implementation	of	Performance indicators characterizing the result of improvement
Creation of a new waste processing plant	Hiring specialists in the production of frames, doors, cornices, baseboards	Studying the most important factors that determine the dynamics of consumer demand for goods, the ratio of demand and supply for such types of products, technical and other consumer qualities of competing products.
		Conducting the marketing research related to the study of market segmentation, consideration of pricing and customer choice, sales forecast and sales channels, opening new markets, evaluating the effectiveness of advertising, competitors' activities.
		Developing the recommendations and forecasts of the company's position in the market. Activities in the field of advertising.
		Creating positive impressions that increase customer satisfaction with the purchased product and provide additional product value in the eyes of consumers, which stimulates sales, business profitability, and sustainable production development.
Outdoor advertising		
Purchase of equipment		Providing the necessary machines, tools, creating a new shop.
Hiring additional specialists in the processing shop		Expanding production, reducing the cost of production (due to a larger number of products), reducing the time spent on order fulfillment.

#### 4. Conclusion

The main sources of reserves for increasing output and sales of products is the company's availability of modern equipment and technology. In the context of economic modernization, this problem becomes particularly important. It is recommended to update fixed assets in a timely manner and carry out major repairs. This will ensure the rhythm of production and improve the quality of products.

The creation of waste-free production will also give great results in improving efficiency.

In this regard, we make a proposal to create a workshop for processing industrial waste. Waste can be used for the production of metal-plastic frames, doors, baseboards, cornices. This will contribute to the expansion of the plant's product assortment, which will lead to an increase in its profit. The presence of an empty building for the workshop will allow you to organize a new production.

Next, we will analyze how the implementation of the above measures will affect the profitability of the enterprise. The proposed measures to improve the management of the product assortment of JSC "Aggregate plant" will entail such costs as hiring a new staff of specialists for the production of metal-plastic frames, doors, skirting boards, cornices; equipment costs for the production of these products, the cost of outdoor advertising, as well as hiring additional workers in the new shop. In table 6, we calculate the costs associated with the implementation of these measures.

**Table 6.** The cost of the proposed activities.

№	Activity	Cost, million soums
1.	Hiring specialists in the production of metal-plastic frames, doors, baseboards, cornices	1.5
2.	Outdoor advertising	1.0
4.	Equipment	7.5
5.	Hiring additional specialists in the new shop	3.5
	Total	12.5

Note: 1 ruble is equal to 145.27 Uzbek soums.

For the calculation, we used the average market prices for outdoor advertising, for the purchase of equipment, and the average annual salary of workers and employees of enterprises. The table shows that these expenses amount to 12.5 million soums. Next, we will calculate the economic effect of applying the proposed recommendations in 2020.

**Table 7.** Calculation of the economic effect of the proposed recommendations in 2020.

Calculation parameters	Financial assessment, million soums
Event cost	12,5
Expected increase in revenue	95
Profit increase	45
Total effect net of expenses	32,5

Note: 1 ruble is equal to 145.27 Uzbek soums.

Thus, the implementation of the proposed set of measures to improve the competitiveness of the enterprise during 2020 will allow to obtain an additional economic effect in the amount of 32.5 million soums.

After implementing the proposed recommendations, revenue will increase by 95 million soums, and net profit by 32.5 million soums.

The return on sales will increase to 36 percent. Another important fact in the competitive advantages of the enterprise will be human capital.

Improving the system of incentives and motivation, increasing the salary of production personnel, as well as applying the scale for seniority, will reduce staff turnover, which in turn will increase the

competitiveness of the company's personnel, preserve qualified personnel and increase labor productivity.

The result of measures to improve competitiveness will be: maintaining and increasing the flow of customers; improving the image of the enterprise; increasing the amount of profit and profitability; increasing the share of the enterprise within the target segment; reducing the cost of production, as well as time spent on order fulfillment, increasing the assortment of products.

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