



RESULTS OF EVALUATION OF NEW POTATO VARIETIES

Ergashev I. T.

Professor

Annotation

As the fact, potatoes are a temperate crop. Therefore, in Uzbekistan potato breeding requires a special approach based on the soil and climatic weather conditions of the region. In the conditions of the republic, the main directions of potato breeding are early maturity, productivity, resistance to viral diseases and suitability for a two-yield crop. Potato varieties Farovon, Gozal and Ulugbek are distinguished by their early maturity, resistance and tolerance to viral diseases and suitability for a two-yield crop. When planted in spring, these varieties provide a high yield with good commercial qualities of tubers.

Keywords. Potatoes, early maturity, viral diseases, biometric indicators, tubers, productivity, crop structure, etc.

Introduction

The selection of agricultural crops is carried out taking into account the zonal features of specific soil and climatic conditions in which it is planned to plant a new variety (4). In the conditions of Uzbekistan, the creation of new varieties of potatoes is carried out according to the zones of early maturity, productivity, suitability for obtaining two crops per year, etc.

An important feature of potato varieties in the conditions of our republic is precocity. It is known that potatoes are a crop of temperate climate. Therefore, one of the main areas of crop breeding in potato-growing countries is mainly resistance to fungi, including phytophthora. However, due to the fact that the main part of the country is characterized by a dry and hot climate during the growing season, viral and mycoplasmal diseases of potatoes are widespread in the country (2). They reduce yield from 5-10% to 80-85% depending on the type of disease, infection concentration, varietal characteristics, soil and climatic conditions and agricultural practices (1,2). Therefore, one of the main directions of potato breeding in Uzbekistan should be virus resistance (1).

The success of the work is determined by a comprehensive assessment and selection of varieties and samples in the breeding process to create varieties suitable for certain soil and climatic conditions.





The creation of early maturing, high-yielding and virus-resistant varieties in Uzbekistan is one of the most pressing issues in the industry to create opportunities to reduce and limit the purchase of foreign seed potatoes for foreign currency, which is now widely used in practice.

Purpose of the study

The breeding process consists in evaluating new varieties of potatoes according to morphobiological and value-economic characteristics and characteristics during the spring sowing period.

The objectives of the study were:

- Evaluation of potato varieties by the length of the growing season;
- To study the patterns of formation of biometric indicators of varieties in spring;
- To determine the degree of damage to potato varieties by viral diseases;
- determination of the yield of varieties and the structure of the crop.

Object and methods of research. The experiments were carried out on the fields of the Samarkand base of the Uzbek Research Institute of Vegetables, Melons and Potatoes. Evaluations were carried out in spring and summer at the time of transplantation, working in a solution of growth stimulants of freshly dug shoots.

The duration of the growing season of the samples was determined by phenological observations, biometric indicators of plants, yield, collecting each plot separately and transferring it to a field unit. 1967) as a percentage of the total yield.

The degree of damage to plants by obvious viral diseases was determined visually, the incidence of latent viruses was determined by serological and enzyme immunoassay, infection at the ends was determined by eye indexing (M.,1972, 1974);

Plant productivity was assessed by measuring the yield in individual glomeruli, and the yield and structure of the crop were determined by determining the yield per hectare per plot, the economic efficiency of the measures used in breeding and primary seed production was determined by NIKS (M. 1967, 1989). The degree of reliability of the results obtained and the yield indicators of varieties have processed by the dispersion method (Dospekhov, 1985).

The results obtained and their analysis. Studies have shown that the duration of the period from sowing to emergence of varieties was 22-24 days. The shortest period from sowing to germination was observed in the shortest variety Firuza (21 days). This result indicates that the germination energy of the variety is strong. The





latest emergence of seedlings have noted in the variety Ulugbek. That plants of this variety sprouted 24 days after planting.

The period from germination to flowering in the studied varieties was 31-35 days, with the fastest (31 days) for the Farovon variety and the longest for the Firuza variety (35 days) (Table 1).

Table 1 Results of phenological observations of new varieties of potatoes. (2020-2021)

Varieties	Duration of the interphase period, days				
	planting - germination	germination	sharpening - bloom	bloom - pale yellow	duration of the growing season, days
Faravon	22	31	12	33	76
Ulugbek	24	33	13	35	81
Firuza	21	35	14	37	86
Gozal	23	32	12	33	77
Sante (control)	22	32	12	34	78

In our study, the duration of the flowering period of plants was 12-14 days for varieties. It should be noted that there was no significant difference between varieties in this indicator. In other words, for the studied Sante varieties such as Farovon, Gozal and Shtamb, this indicator was 12 days, for the Ulugbek variety it was 13 days, and for the Firuza variety the longest period was an average of 14 days.

In phenological observations, the period from the period of mass flowering of plants (75%) to yellowing of the stems was 33-37 days for varieties, and the shortest period was noted for Farovon and Gozal varieties (33 days). In varieties Ulugbek and Firuza, it was 35 and 37 days, respectively.

It should be noted that the Farowon variety was the fastest growing in terms of the total period of plant growth. The duration of the period from germination to yellowing was 76 days. This was 2 days shorter than Sante's standard navigation.

Firuza had the longest growing season of 86 days, while Ulugbek had 81 days. The variety Beautiful studied in our experiments also showed faster maturation than the standard variety and the duration of the period from germination to yellowing of plants was 77 days.

Based on the results of phenological observations, it can be concluded that the Farovon and Gozal varieties ripen faster than the standard and the Ulugbek and Firuza varieties ripen 3-8 days later than the standard.



Studies have shown that among the studied specimens, the plant height is higher than the rest in terms of the number of stems and leaves in the Firuza specimen. For example, during the flowering period of this variety, the average height was 89 cm, the number of main stems was 4.4, and the number of leaves was 141, while in the studied standard of the Sante variety, these figures averaged 79 cm, 3.5 and 3.5 see 115 (Table 2).

Table 2 Morphobiological features of varieties (2020-2021)

T/r	Indicators	Varieties				
		Faravon	Ulugbek	Firuza	Gozal	Sante (control)
1.	Plant height, cm	76	81	89	86	79
2.	Number of main stems, pcs/plant	3.8	4,0	4.4	4.2	3,5
3.	Number of leaves per plant	110	119	141	128	115
4.	Number of side stems, pcs.	18	24	36	28	22
5.	Absorption surface, thousand m ² /ha	30,3	40,5	45,4	42,0	39,5

It has been established that the biometric indicators of the Gozal and Ulugbek varieties are superior to the standard variety, and the Farovon variety has a lower plant height than Sante Navigator, a smaller number of leaves formed on each plant, and a smaller number of lateral stems. The highest indicator of the formed leaf surface in plants have observed in the Firuza variety (45.4 thousand m²/ha). The studied varieties Ulugbek and Gozal formed a higher assimilation surface (40.5-42.0 thousand m²/ha) compared to the standard navigation according to this indicator. Among the varieties, a low assimilation surface (30.3 thousand m²/ha) have formed in the Farovon variety compared to the Sante Navigation standard of 39.5 thousand m²/ha.

These data showed that the specified feature of the variety is consistent with the morphobiological characteristics of early ripening varieties according to the literature data.

Virus resistance assessment results. In competitive variety testing for the resistance of new potato varieties to viral diseases created as a result of breeding work, all the studied varieties in terms of symptoms of plant diseases in the study to assess the degree of infection of plants with viruses were lower than in all the studied



varieties. standard grade. For example, this type of damage in varieties was 2.0-5.5%, and in the standard variety Sante this figure was 8.0%. (table 3).

Table 3 Infection of plants with viruses and viral diseases (2019-2021)

№	Varities	Viral diseases and virus infections, %					
		obvious damage	in secret	including viruses			
				X	S	M	Y
1.	Faravon	2,6	18,3	-	7,3	5,1	5,9
2.	Ulugbek	2,0	17,6	4,1	6,2	-	7,3
3.	Firuza	2,5	16,4	6,2	8,2	2,0	-
4.	Gozal	5,5	25,0	9,5	5,1	4,5	3,9
5.	Sante (cn)	8,0	28,5	9,0	7,5	8,2	3,8

According to the results of determining the level of virus infection with latent forms of viruses, all new varieties have a lower rate than the standard variety, viruses were found in 16.4-25.0% of the total number of tested plants in 28.5% of plants standard varieties have infected with such viruses .

It should be noted that the lowest rate of viral infection (16.4%) was observed in plants of the potato variety Firuza.

Valuable results have been obtained on the reaction of the studied varieties to individual viruses. For example, Farovon was infected with the X-virus, Ulugbek with the M-virus, and Firuza with the Y-virus. This in turn, allows to us to conclude that these varieties are resistant to these viruses.

It is known that in recent years, one of the main problems of growing potatoes in our country is the fight against the Colorado potato beetle. This is due to the fact that years of strong spread of this pest sharply reduce it, causing great damage to agricultural crops.

That is why the resistance of newly created varieties to the Colorado potato beetle is of great importance. Therefore, the "attitude" of new varieties to this dangerous pest is one of the most urgent problems of crop breeding.

Yield and yield structure of potato varieties. One of the main directions of crop breeding is productivity. Because productivity is the end result of any valuable traits in new varieties. The composition of the harvest is a valuable economic indicator and the economic performance of the farm growing the variety is determine by the demand for the product.

The above data served as additional evaluation criteria in our studies on the evaluation of varieties for early maturity and resistance to viruses.



The yield of the variety was determined by collecting the plot and calculating it per unit area. When determining the structure of the obtained crop, the consumption of small stems weighing up to 30 grams on average, 30-80 grams on average and large masses over 80 grams as a percentage of the total yield and in quantitative terms have evaluated.

In our studies, the yield of new potato varieties was higher than the standard variety (21.1 t/ha) and amounted to 23.3-27.0 t/ha. It should be noted that the highest yields were obtained from Ulugbek and Firuza varieties. The average yield of these varieties was 25.2 t/ha (Ulugbek variety) and 27 t/ha (Firuza variety). The yield of Farovon and Gozal varieties averaged 23.3-25.7 t/ha (Table 4).

Table 4 Yield of new potato varieties grown in spring (t/ha, 2015-2017)

№	Varieties	Productivity by return, t/ha			Average yield, t/ha
		I	II	III	
1.	Faravon	23,0	23,9	23,3	23,3
2.	Ulugbek	24,0	25,3	26,3	25,2
3.	Firuza	26,3	26,5	28,2	27,0
4.	Gozal	25,2	26,0	25,9	25,7
5.	Sante (cn)	20,6	20,9	21,8	21,1

EKF05 = 1.1-1.4

t/ha According to the results of assessing the structure of the yield of new potato varieties, the highest yield of tubers weighing more than 80 grams have obtained from the varieties Firuza (21.3%) and Ulugbek (18.4%). That is the increase in the total yield for all varieties occurred mainly due to an increase in the cost of commercial rootstocks, which in turn occurred due to a decrease in the cost of small rootstocks. For example, in the Firuza variety, the consumption of small tubers weighing up to 30 g was 5.2%, and in the Ulugbek variety, on average, 6%.

Among the studied varieties, according to the yield structure, the Farovon and Gozal varieties are inferior to the standard in terms of the yield of large tubers weighing more than 80 grams. For example, the Farovon large variety had 12.2% yield, and the Guzal variety had 13.6%. In the standard variety, these figures were 16.0%. Уруғлик туганаклар чиқими (массаси 30-80 г) бўйича энг юқори кўрсаткич Фаровон (82,4%) ва Гўзал навларида (80,4%) кузатилди. Товар туганаклар чиқими юқори бўлган



In varieties Firuza and Ulugbek, due to the high yield of large stems the yield of stems in the seed fraction was somewhat lower (73.5-75.6%) (Table 5).

Table 5 Yield structure of new potato varieties

№	Varieties	Faravon		Ulugbek		Firuza		Gozal		Sante (cn)	
		t/ha	%	t/ha	%	t/ha	%	t/ha	%	t/ha	%
1.	Productivity, t/ha	23,3	100	25,2	100	27,0	100	25,7	100	21,1	100
Yield structure											
To 30 gram		1,3	5,4	1,5	6,0	1,4	5,2	1,5	6,0	1,4	6,5
To 30-80 gram		19,2	82,4	19,0	75,6	19,8	73,5	20,7	80,4	16,3	77,5
Over 80 gr.		2,8	12,2	4,7	18,4	5,8	21,3	3,5	13,6	3,4	16,0

The all varieties increase in yield occurs due to a decrease in the yield of small tubers from the total harvest (5.2-6.0%) and an increase in the consumption of large tubers (12.2-21.3%), the highest rate of seed material, germination (73.5-82 g, 4%) was observed in varieties Farovon and Gozal.

Conclusions

The new potato varieties Farovon, Gozal and Ulugbek have created as a result of our research which are characterized by early maturity. Resistance and tolerance to some viruses as well as the ability to harvest two crops a year. Valuable results have been obtained on the reaction of the studied varieties to individual viruses. For example, Farovon have infected with the X-virus, Ulugbek with the M-virus and Firuza with the Y-virus. This allows us to conclude that these varieties are resistant to these viruses. In addition, their high yield (23.3-27.0 t/ha) and marketability when grown in the spring showed that the varieties are suitable for cultivation in this period.

References

1. Эргашев И.Т. Безвирусное семеноводство картофеля. Т. Фан. 2007., 157р.
2. Ergashev I.T., Begimqulov.I.B. Razzokov J. Oblakulov F. Scaintific hypotesis "Variety and population in agrobiocenosis of potatoes" International Journal of Psychosocial Rehabilitation. ISSN:1475-7192. Page No. 4638-4641<https://www.psychosocial.com/article/PR260452/14754/>
3. Ergashev I.T., Normurodov D.S., Eshonkulov B.M. Scientific basis of virus-free seed potatoes in Uzbekistan, Tashkent, 2017. 162 p.
4. Web sites: <http://www.chemicalnow.ru.>, <https://www.science-biology.ru.>

