

Short Communication

The effective method of potato cultivation

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Potatoes occupy a considerable place in food ration of Uzbekistan's population. That is why over the past few years, there are various researches on traditional ways of increasing the amount of potatoes produced as well as the generally accepted methods of their cultivation. One of such methods is generative propagation of potatoes.

Key words: True potato seed, greenhouse, seedlings, minitubers, potato seed tubers.

INTRODUCTION

As it is well known, the cultivation of potatoes from botanical seeds has a number of advantages over vegetative propagation; they include economical seed tuber material of 3.0-3.5 t from every hectare and the low expenditures connected with storage and transportation of potatoes (Ergashev, 2006; Budin, 1987).

When taking into consideration, that the expenditure for the seed materials comprises 55-60% of the total expenditures for the crop cultivation, it becomes evident that it is the prime cost of the product produced (Ergashev, 2006; Ross, 1989).

Research shows that in generative propagation of crop area of 1 ha, 70-100 g of botanical seeds are used; and virus, viroidal, micoplasmous and bacterial diseases affecting potatoes are not spread to the following generations, both during the period of vegetation and storage of tubers. That is why this method is the best for seed-growing of potatoes because it is virusless (Ergashev, 2006).

Taking into consideration the above circumstances, in 2012-2014 we conducted a research on the selection of

sorts, hybrids, hybrid populations and self-pollinated lines of potatoes, suitable for generative propagation and also for elaboration of effective technology for its cultivation, leading to obtaining high yields of marketable and seed potatoes with the least prime cost for product produced.

MATERIALS AND METHODS

The research was carried out on the experimental plot of Samarkand Strong Point of Scientific-research Institute of vegetable-gourd Crops and Potatoes of the Republic of Uzbekistan. The botanical seeds of 42 sorts, hybrids, hybrid populations and self-pollinated lines, obtained from the Scientific Production Association on Potatoe-growing (Moscow), all-union Institute of plant-growing and in the firm "Sedek" (Moscow) and collected units from the sorts cultivated under local condition of Uzbekistan, served as initial materials.

The seeds were sown in the film hot-houses early in March to get seedlings. The seedlings were planted on open ground on 2nd of April according to the scheme 70 x 20 cm. During the research, the germinating power of seeds and acclimatization of seedlings was determined. Phonological observations, biometrical measurements,

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Table 1. The attack of plants by viruses with regards to potato production from true potato seed (2012 – 2014 years).

S/N	The origin of seeds	In overt form (%)	In latent form (%)	The attack of plants by viruses (%)			
				X	S	M	Y
1	Surkhan-1	0	4.0	-	1.0	2.0	1.0
2	Curado	0	2.3	-	-	-	2.3
3	Triumph	0	1.5	1.5	-	-	-
4	Ballada	0	4.5	2.5	-	-	2.0
5	Deva	0	3.6	0.6	2.0	1.0	-
6	Assol	0	3.8	3.5	0.3	-	-
7	Vilona	0	2.9	0.7	1.2	-	1.0
8	Sante (at planting with tubers of the first reproduction)	9.2	35.2	8.2	11.2	6.3	9.1

Table 2. The peculiarities of the growth, development and tuber formation of potatoes at generative propagation.

S/N	The origin of seeds	Germinating power of seeds (%)	Acclimatization of seedlings (%)	The productivity of plants g/bush	Yield per ha in center	Profitableness of the production
Generative propagation						
1	Surkhan-1	92	97	520	160,0	201,7
2	Curado	89	93	210	149.0	147.2
3	Triumph	91	96	580	150.0	152.7
4	Ballada	85	90	286	130.0	166.0
5	Deva	88	92	450	185.0	212.2
6	Assol	86	91	320	145.0	140.8
7	Vilona	90	94	380	135.0	128.2
8	Sante (at planting with tubers of the first reproduction)	-	-	465	232.0	126.7

serological and immunophermental analysis, visual method of determining viral infection of the plants, the productivity of plants and yield-capacity of samples were also conducted (Okhrimenko, 2013). The Methodology of the Research on the Potato Crop (1967) was followed.

The economic effectiveness of potatoes cultivation with true potato seeds was determined according to generally accepted methods (Tables 1, 2).

RESULTS AND DISCUSSION

The research ascertained that the samples had different indexes according to germinating power of seeds, and acclimatization of seedlings. Thus, they were much higher intersort hybrids as compared to intertype hybrids. There was positive correlation between the germinating power of seeds and acclimatization of seedlings. The highest indexes in this respect were obtained from hybrid

populations.

It is necessary to note, that the vegetation period of plants in average comprises 120-136 days depending on genetic origin. Serological and immunophermental analysis showed that the total viral infection of plants at the generative propagation had the least index as compared to plants of tuber origin and 1.5-4.5%, depending on the sample and year of cultivation.

The insignificant infection of plants, grown from botanical seeds can be the result of their infection during vegetation period. 35.2% of plants of the first reproduction positively reacted to the content of viruses in latent form under productive conditions at the tuber propagation. The productivity of plants at generative propagation comprised 210-580 gr/bush depending on their genetic origin. During cultivation of potatoes with tubers, the average productivity of plants comprised 465 g from every bush.

The determination of economic effectiveness of

different methods of cultivation has shown a great advantage of generative propagation in comparison with generally accepted method. Thus, by the saving of planting material and by obtaining healthy, free from viruses plants and owing to high productivity, the profitability of the production is up to 212.2%

Conclusions

This research has shown that with generative propagation, 1-2 tuber potatoes can be used as seeds. In spite of the genetic diversity of qualities, they give high and qualitative yield. This affirms that the new method can serve as an effective method for creating the initial material for true potato seed-growing.

The obtained data show that the generative propagation of potatoes can serve as an effective way of getting qualitative seed and marketable potatoes.

Conflict of interest

The authors did not declare any conflict of interest.

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