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## ENVIRONMENTAL CONDITIONS FOR RAPID MULTIPLICATION OF ELITE VARIETIES OF POTATO

### Abstract

The article provides for environmental impact on the methods of rapid multiplication of elite varieties of potato. Climatic conditions and the soil cover of West Kazakhstan is a good influence for maximum productivity. Today in the world is sharp debate about the environmental safe product. Therefore, at the present time the theme is relevant.

*Keywords: Environmental influence, climatic conditions, sprouts, the methods of propagation.*

Potatoes are a culture of versatile using, applied to food, fodder and technical purposes. According to FAO (2000), about 60% of the world's potatoes are used fresh or processed for human consumption, about 15% for animal feed, about 5% for processing for industrial purposes, and 11% for planting. The importance of potatoes in human nutrition due to their content of starch, protein, vitamins and minerals. Depending on the variety and conditions of cultivation in potato tubers contain 15-35 % of dry matter, including 17-29 % starch, 1-2% protein, about 1% mineral salts.

The great value of potatoes and as a source of vitamins C, group B (B1, B2, B6), PP. With daily using 300g of potatoes, you can enjoy 70 % of the daily requirement for vitamin C 36 % vitamin B6 20 % vitamin B1, 8% for vitamin B2.

Potato is an important industrial crop, the tubers of which are used as raw materials for the alcohol and starch industry. From 1 ton of tubers starch content of 17% produced an average of 170 kg of starch or 170 kg of molasses, 110 gallons of alcohol. The starch of potato is used to produce more than 500 kinds of products for the food, paper, textile, woodworking, construction, chemical and pharmaceutical industries [1].

The potential yield of many modern varieties of potatoes reaches 60-80 t/ha. However, average yields of culture for many decades are 12-16 t/ha in Kazakhstan, and 13.4 to 15.5 t/ha. One of the reasons for low yields is the using of infected seed material fitopatogene 3-4 reproduction, plantings unstable or susceptible to diseases of potato cultivars etc [2].

The region is practically absent free of viral infections of the original seed material of potatoes. This adversely affects the timeliness and quality of cartoony and renovation and is perhaps the major deterrent to diversification of crop production aimed at generating competitive products.

If the usual ways of breeding planted tuber yields 10-15 new tubers, while the accelerated reproduction of 100-150 or more. Basically rapid reproduction is carried out for fast obtain maximum yield from the elite potato tubers. Methods of accelerated reproduction of potato few, among them the most common methods:

1. Shadow and light sprouts of elite seeds of potatoes.
2. Propagation of potato by the method of U. Hamann
3. Propagation of potatoes by rooting the tops and axillary shoots
4. Propagation of potatoes by dividing the bush

5. Propagation of potato by division of the tuber
6. Biological hybrid potato seeds.

In this article we will talk about climatic conditions for growing elite free virus potatoes. The basis of the production technology of virus-free elite potatoes using modern methods of agricultural biotechnology is the healthier plant of potato in vitro, which is replicated on a nutrient medium under conditions of artificial climate. This is the most complex and expensive link in of virus-free seed potatoes. It microclonal propagation of potato plants in vitro requires a high level of professionalism and investment of quite a large amount of cash. Therefore, the cheapening and simplification of the process in the production of virus-free elite requires replacement of this method by a more simple and more economical method. When searching for such paths in which we are developing the production technology of virus-free elite method of microclonal propagation of potato plants in vitro were replaced by the method of propagation of potato plants by the method of U. Hamann. In this case, the basis of the production technology of the elite is virus-free plant, propagated in vitro, and virus-free tubers, sprout cuttings which are replicated virus-free potato plants.

The climate of Western Kazakhstan region has a number of features. He is sharply continental with cold winter and hot dry summer, late autumn and early spring frosts, winter thaws and the lack of unstable atmospheric moisture. The soil of West Kazakhstan region is dark brown. In my article we will talk about the methods of U. Hamann, which made his way to raise of propagation the elite of potato. For this I prepared elite potatoes for landing in the autumn last year. The first method proposed by Hamann. U. Hamann consist of the following main events: in the autumn-winter period free from virus infection, the tubers are laid on a long germination in the basement when temperature 15-18° C and periodicity lighting – 8 days light, 8 dark; 35-45 days before embarkation potatoes (spring), sprouts obtained from tubers on individual segments of the kidney (figure 1) and placed in a ditch or box soil of which, constituting 14 day grow up fully plants; the resulting plants are planted in the film or film-gauze insulators. Normally, the spring shoots reach a length of 10-20 cm and more. 20-30 days before planting the sprouts break off at the base of the fallopian tuber and start cuttings. Separated from tuber sprouts are cut into the glass with a razor blade into pieces with a length of 1.5 cm according to the number of rudimentary drip. Cuttings are laid on humid filter paper in the cell, which upon completion, close the sheet of glass. The cell from time to time air. Glass shoot for about 1 hour a day. In such a humid chamber at room conditions, the cuttings grow quickly, they appear rudimentary roots and young sprouts. In 2-4 days the sprouted cuttings are planted in an indoor soil or grow them from seedlings, and which can later be planted in open ground [4].

Plants can be planted in the open ground, using while transplanting machine; tuber material from plants of sprout cuttings for the following year is used to obtain the super-elite, next elite. Thus, when using this technology in production elite material of potatoes you can get in the third year. At the same time, the proposed scheme of production of virus-free elite potato includes following nurseries – nursery: super - superelite (the first year), nursery superelite (second year) nursery elite (third year).

At a temperature of 15-18° C and the humidity of 40-70 % we can see the growing of potato sprouts.

Table 1 – The growth of potato sprouts by days

Days	Akzhaik	Nikita
10 <sup>th</sup> day	1.5 sm	1.1 sm
20 <sup>th</sup> day	3.2 sm	2.6 sm
30 <sup>th</sup> day	5.1 sm	4.0 sm
40 <sup>th</sup> day	6.6 sm	5.5 sm
50 <sup>th</sup> day	8.0 sm	7.1 sm
60 <sup>th</sup> day	9.7 sm	8.4 sm
70 <sup>th</sup> day	11.3 sm	10.4 sm
80 <sup>th</sup> day	13.6 sm	11.2 sm
90 <sup>th</sup> day	15.2 sm	12.5 sm

In studies of plant propagation based on the method of U. Hamann spent of free of viral infections tuberous material of sortspatatoesAkzhaik, Nikita. Researches have shown that the greatest yieldcuttings from potato tubers kept for a long time to sprout,was observed in potato varieties Akzhaik.



Figure 1 – Cuttings of the tubers of potato sprouts/ the method of U.Hamann/

One of the varieties of the potato tuber varieties Akzhaik the average yield of cuttings was 53 pieces. All of the sprouts of potatoes were survived thanks for climatic conditions which contributed to good development of sprouts. There are sunlight, atmospheric air, warm water, humidity. We can confidently say for harvest elite varieties of potatoes due to the geographical terrain, soil and environmental pleasant conditions.

U. Hamann method does not require any biological products for rapid propagation of elite varieties of potatoes. This method gives us the opportunity to grow ecologically clean produce for the use of food for nourishment. Organic food is an integral part of human health and society, so this topic is very relevant.

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#### ТҮЙІН

Бұл мақалада элиталық картоп сорттарын жедел көбейту әдістеріне қоршаған ортаның әсерлері қарастырылады. Батыс Қазақстан облысының климаттық жағдайлары мен топырақ жамылғысы ірі көлемде өнім алуға жағдай жасайды.

Қазіргі таңда әлемде экологиялық таза өнім мәселесі алға қойылған. Сондықтан бұл тақырып қазіргі таңда өзекті болып отыр.

#### РЕЗЮМЕ

В статье рассматривается воздействие окружающей среды на методы ускоренного размножения элитных сортов картофеля. Климатические условия и почвенный покров Западного Казахстана хорошо влияют на урожайность картофеля.

В настоящее время в мире идет острая дискуссия об экологически безопасном продукте, поэтому тема очень актуальна.