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Abstract. The article discusses measures to prevent the shortage of vegetable and vegetable crops, increase their yield. In order to meet the demand of the population for these products if necessary to have export potential it is necessary to apply the achievements of modern science to the products grown. The use of new modern technologies will make a significant contribution to the development of the agricultural sector. When growing products in agriculture, traditional methods that require a lot of work should be abandoned. In this article there are seeds of muhima ahamita when growing crops. Germination and good crop development indicate the need to use modern technologies in seed processing. At the same time, it is necessary to take into account the cultivation of seeds and several factors affecting it. When treating seeds with ultraviolet radiation, it is necessary to study the effect of the exposure dose of light.

1. Introduction

In agriculture of the Republic of Uzbekistan, about 60 percent of vegetable crops are grown from seedlings. In the sunny country, it is possible to grow seedlings and effectively use protected ground structures when harvesting vegetables 2-3 times a year [1,2].

In the Republic, such an opportunity is important to meet the demand of the population for plant products and prevent a shortage of food problems that occur in the real world. In order to provide the population with affordable, high-quality food, increase production, greenhouses created in the republic and the use of modern methods of growing vegetable seedlings using electrotechnological methods are now relevant [3,4].

In vegetable growing, it is observed that plants grown from seedlings are ahead in growth and development compared to similar plants grown not from seedlings. This promotion leads to faster maturation of the plant, the sale of products on the market at good prices and a higher economic effect. Thus, many of our farmers benefit from growing vegetable crops from seedlings than when growing early crops in the open ground and greenhouses. But for some farmers and residents there is a lack of information and experience in the preparation of vegetable seedlings [7,6].

Intended for transplantation to a permanent place of growth, a young sprout is called a seedling, whose organs have not yet been formed. The essence of growing plants with seedlings is a small top

dressing, in which there are enough nutrients and moisture during the first period of their life, it consists in growing in the field, in an artificial climate, and then transplanting to open or protected ground structures. It is grown in protected soil due to the fact that it is impossible to grow it in the open ground in accordance with the temperature regime. More than half of vegetable crops in the open ground and about 90 percent of seedlings in the protected ground are planted in order to use the seedling method in crops that require a large area of top dressing at the end of the growing season and are designed to receive an early harvest [10,11,13].

2. Materials and methods

Currently, seedlings for open and protected soil are grown mainly in film greenhouses with heating, and in private plots of film greenhouses. In the winter-spring cycle for protected soil, seedlings are grown in the seedling compartment of heated winter glass or film greenhouses. For other crop rotations, seedlings are grown in specially adapted structures for this purpose. The method of growing seedlings has a number of advantages compared to conventional sowing of seeds directly into the ground. Seedlings are usually grown for 30-80 days. The progress made in the development of plants allows you to get an early harvest. The sale of early harvest at high prices provides additional income. Thanks to the pre-planting of seedlings in the flooring, it allows you to stretch the growth period. This increases the yield of the plant and makes it possible to grow heat-loving crops and enrich them with various vegetable assortment in the northern regions, where the growing season is considered long and there is a shortage of sunlight [14,15,17].

It is impossible to properly implement the technology of growing vegetable seedlings without taking into account environmental conditions and obtain a satisfactory harvest. In the facilities where seedlings are grown, it is possible to create an artificial microclimate and an optimal soil environment, taking into account the characteristics of plants, age, variety and purposes of cultivation, as well as existing climatic conditions[18,19].

Microclimate is a physical change in the parameters of the environment in which the air and root crops are located in the structures in which any crop is grown. Solar radiation is the main process that creates the climate, and is the main factor determining the type and varieties of protected land structures in the existing location, the selected crops and the timing of their cultivation[9].

In Uzbekistan, there is a very high amount of sunlight at the end of spring. One of the ways to eliminate this overheating is to cool the radiation, the light entering the room. Cooling is carried out in two ways: 1) staining the light-permeable surface of structures or spraying white liquid and water on it; 2) applying various cooling nets, curtains, screens similar to light-permeable covering materials[16].

There are the following environmentally friendly electrotechnological methods of exposure to seeds with ultraviolet radiation. For example, V. Kharlamov affected sprouted cucumber seeds with a root tip length of 0.5 mm by irradiating them with a mercury-quartz source irradiating them with a wavelength of 400 nm. The lighting source was maintained at a constant voltage of 180 V. During the irradiation time of 15, 30, 45, 60 and 75 minutes, irradiated at a distance of 25 cm from the source to the seeds. In each variant, 50 plants were observed. The author claims that plants grown from irradiated seeds for 75 minutes germinated earlier than the controlled ones: male flowers - for 2 days, female flowers - for 5 days; irradiated for 60 minutes, respectively, from 3 and 6 days. With a 75-minute exposure, there is an increase in the number of lateral lashes of seed flowers and a decrease in the number of uncharged specimens. In the variant with a 60-minute exposure, the number of fruits in relation to the control increased by 55%, and their weight increased by 39.5%. It was also noted that the intensity of the growth of green mass in the first decade is directly proportional to the duration of irradiation of seeds at the stage of their germination[12,17].

A comprehensive study of the effects of ultraviolet radiation on seeds was conducted by Nicotine Labacum and others. Under the influence of 5, 10 and 20 minutes of irradiation, they achieved germination of experimental seeds with 79%, 91% and 46% of control seeds, respectively. The seeds irradiated for 10 minutes showed good results compared to the control. They germinated in 5 days, the yield of the total mass of leaves increased by 78%, and seeds - by 181%. Scientists have also observed

significant changes in plant growth due to some other morphological changes. Under the great influence of irradiation, the plants ripened in a week, but gave a low grain yield and a lot of leaves[9,13].

Ultraviolet irradiation before sowing seeds significantly increases their germination energy and germination, accelerates plant maturation, increases yield and product quality, as a result of which a complex of other agrotechnical measures is increasingly used. In addition, the UV method of seed irradiation is inexpensive, high-performance, energy-efficient and economically justified.

At the same time, the most effective dose of UV radiation for cucumbers, tomatoes, sweet peppers and other vegetable crops has not been established. Therefore, it is recommended to conduct a study of the effect of UV irradiation of sweet pepper seeds. Determination of the best dose of UV radiation. Taking into account the positive effect of ultraviolet radiation on seeds, it is necessary to develop an appropriate technological process and propose methods for calculating the dose of UV radiation for this technological process, as well as to develop a device that allows you to control the dose of UV. The complete and perfect development of this technological process increases the efficiency of the supply of its seedlings for growing sweet peppers both in greenhouses and in open areas.

As the main indicators evaluating the process of germination of vegetable seeds, the process of irradiation of sweet pepper seeds and the parameters of the irradiation device should be taken. In their case, various electrical and technological factors influence. To study the factor-multiple effect, it is necessary to determine their functional relationship with the degree of germination and technological parameters.

The research is carried out using mathematical theory when planning experiments in order to reduce and improve the accuracy of the experiments, to obtain mathematical equations of the process, as well as to determine the optimal operating parameters of the study. For mathematical and statistical processing of the results of a single-factor study, it is necessary to use several independent factors. At the same time, it is necessary that the selected factors consist of influencing factors that change without interdependence from each other. We can test vegetable seeds using 2 or 3 complex variable factors when treated with electric radiation. These are the following:

1. Height of the irradiator suspension, meter;
2. Processing time, min;
3. Mains voltage, V.

An experiment obtained after processing seeds of vegetable and vegetable crops with one-time ultraviolet irradiation, which allows the use of variations, the height of the irradiator suspension and the processing time when checking the results by the method of multifactor experiments. Because during the irradiation process, seeds can be processed from 5 minutes to 15-20 minutes, during this time, the change in network voltage may not differ much.

To construct the experiment planning matrix, the transition of factors from their real values to the encoded (dimensionless) value was performed using the following expression:

$$x_i = \frac{X_i - X_{i0}}{\varepsilon} \tag{1}$$

where: x_i-is the encoded value of factor i;

X_i - control value of factor I;

X_{io} is the value of the zero level regulator i;

ε - is the interval of change of this coefficient.

For each factor, we first encode by setting a zero level and a change interval.

We can choose the type of mathematical model in the following view:

$$y = b_0 + \sum_{i=1}^{n} b_i x_i + \sum_{i<j}^{n} b_{ij} x_i x_j + \sum_{n=1}^{n} b_{ij} x_i^2 \tag{2}$$

The method of planning a secondary experiment of the Box-Benken type can be used.

3. Results and discussion

From the initial experiments, the main parameters affecting the process of germination of seedlings (day) under irradiation of sweet pepper seeds were obtained:

1. The height of the suspension of the irradiating device, m;
2. Duration of irradiation of vegetable and melon seeds, min;

During the experiments, three experiments were conducted at each point of the spectrum of the Box-Benken plan. The order of the experiments was established in accordance with the table of numbers.

These factors, intervals and levels of their transformation are defined in Table 1.

Table 1. Intervals and levels of change of factors.

Factor designation		Levels	Interval	factors		
Coded	Natural			-1	0	+1
X_1	l	Height of suspension of the irradiator, meter.	ε_{X1}	X_{1min}	X_1	X_{1max}
X_2	t	processing time, min.	ε_{X2}	X_{2min}	X_2	X_{2max}

For this plan, the matrix of basic functions, the expression of the experiment, is checked by the Cochran criterion.

By converting the encoded values into natural values and electric irradiation after the corresponding changes, the expression of the mathematical model of vegetable and garden seeds representing the germination process is determined:

$$\tau_{germination} = A - Bl + Ct + Dlt + El^2 - Ft^2 \quad (3)$$

To find the optimal value of a mathematical model, it can be calculated in the right computer program, for example: PascalABC. As a result of the research, the following optimal parameters of the process of irradiation of seeds of agricultural crops by irradiating seeds of sweet crops and observing the germination of seeds were determined: the height of the suspension of the irradiating device is X_1 m, the duration of irradiation is X_2 min. According to these parameters, it was determined after how many days the germination of seeds of agricultural crops will occur during processing.

To calculate the optimal value of the mathematical model in the PascalABS computer program, a calculation algorithm was developed in the PascalABS computer program to find the optimal value of the mathematical model according to the flowchart of the algorithm for calculating the level of acceleration of the process of germination of sweet pepper seeds when irradiated with ultraviolet light.

4. Conclusions

Thus, the use of ultraviolet irradiation of seeds in vegetable growing is very promising, and irradiation of seeds of agricultural crops before planting has a beneficial effect.

For growing sweet pepper seedlings in greenhouses, December 6, 2022, treated with ultraviolet irradiation and untreated seeds are planted in a cup, the results of monitoring their germination and reproduction.

2. As a result of studies after irradiation of sweet pepper seeds and observation of seed germination, the following optimal parameters of the process of irradiation of sweet pepper seeds were determined: the installation height of the irradiating device is 0.5 m, the duration of irradiation is 9.4 min. The germination of sweet pepper seeds during processing in these parameters is 8 days (Figure 1).

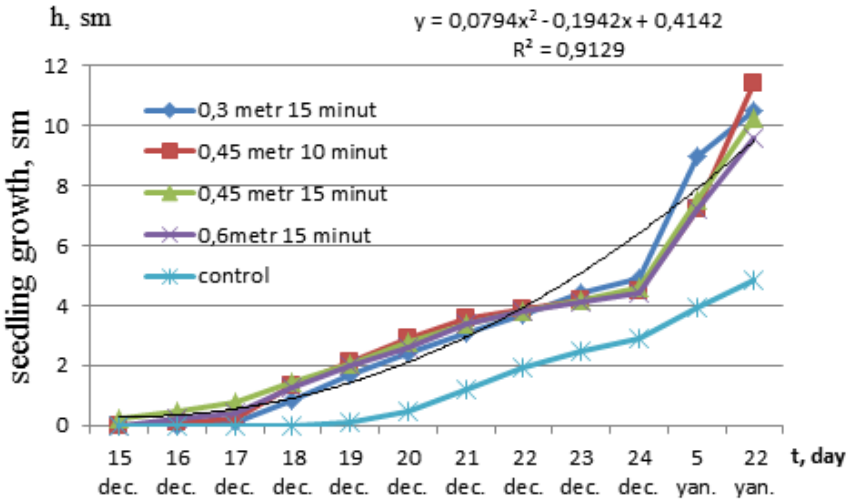

Figure 1. Time-dependent growth graph of sprouted seedlings.

We invite interested researchers and specialists to cooperate with us.

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