

PAPER

EXPERIMENTAL RESEARCH ON THE EFFECT OF AEROION TREATMENT ON PRODUCTIVITY IN THE PROCESS OF REVITALIZATION AND MAINTENANCE OF MULBERRY SILKWORM SEEDS

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Abstract

This article develops the results of experimental studies of aeroion processing in the process of animating and breeding mulberry silkworm seeds, a mathematical model based on experimental studies that represents the process of animating and treating silkworm seeds with aeroions in the process of breeding. The result is that, based on the mathematical model of mulberry silkworm seed and worm from the optimal parameters of the process of processing with aeroions, the processing voltage is 6000 volts, the processing time is 4 hours, and the distance between the electrodes is 20 mm. when the aeroion consetrosion was 500–700 ai/cm² and the maximum quality of the Saw quality indicators was provided.

Key words: Silkworm seed, silkworm, cocoon, embryo, degree of revival, electrotechnology, aeroion, Crown raziriad, voltage, processing time, atmosphere, oxygen, temperature, distance between electrodes, dead air, living Air.

INTRODUCTION

The decree of the president of the Republic of Uzbekistan dated 07.06.2022 PQ-273 “on additional measures for the effective organization of the implementation of the tasks set out in the strategy of agricultural development of the Republic of

Uzbekistan for 2020–2030 as well as the decree of the president of the Republic of Uzbekistan dated May 3, 2024 PF-72 “on accelerating the introduction of market mechanisms, decrees and other regulatory legal acts related to the network set out important tasks for the further development of

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silk industry in the Republic.

In the implementation of these tasks, in addition to the beneficial physiological effect on living organisms in the stage of revitalization of mulberry silkworm seeds and maintenance of silkworms, artificial aeroionization of air is important to eliminate the negative effects of dust and microorganisms and, as a result, to develop an environmentally pure electrotechnological method in order to reduce morbidity, ensure high [1,2,3].

In the atmosphere, under natural conditions, positive and negative air ions will be present. Air ions are usually called aeroions. Negative aeroions are formed by the capture of some free electron by neutral gas molecules in the air. It is considered the easiest to make negative oxygen aeroions appear than from a scientific point of view. Because the outer electron shell of the oxygen atom has 6 electrons, this shell lacks 2 electrons to be filled with electrons. Therefore, the oxygen atom tends to be stable by adding an electron to itself, transforming from a neutral molecule into a negative oxygen aeroion. Russian scientist A.L.Chizhevsky had proven that negative aeroions in the air are formed mainly from oxygen molecules, in the case of positive ions, as a result of the loss of valence electrons by carbon anhydride gas molecules.

If the concentration of aeroions in the air decreases or increases in moderation, this is a harmful factor for the health of living creatures. Air devoid of positive and negative ions is "dead". These concepts of "dead air", "living air" were first introduced by A.L.Chizhevsky introduced and later confirmed by other scientists [4].

The beneficial effect that air ionization has on all living things is positively influenced by organisms - people, animals, plants, birds located in buildings with natural negative ions of oxygen - to grow well [5,6,7,8,9,10]. From these hulasas, experimental studies have been carried out to study the application and parameters of aeroionization technology from electrotechnological technologies in the process of revitalization and maintenance of mulberry silkworm seeds.

MATERIALS AND METHODS

All research is carried out on the mulberry silkworm Liniya 27 x K-108 and Ipakchi 2 breeds and stables. Experiments in increasing saw quality indicators

by increasing the amount, constancy, nutritional value and viability of mulberry silkworm seed revitalization during maintenance have been researched by changing the processing time (τ) exposure voltage (U) and the distance between electrodes (l). The results of the study were determined by the percentage of revitalization of mulberry silkworm seeds (s), the nutrition and survival of Mulberry silkworms (Z) and the level of cotton production and quality (n).

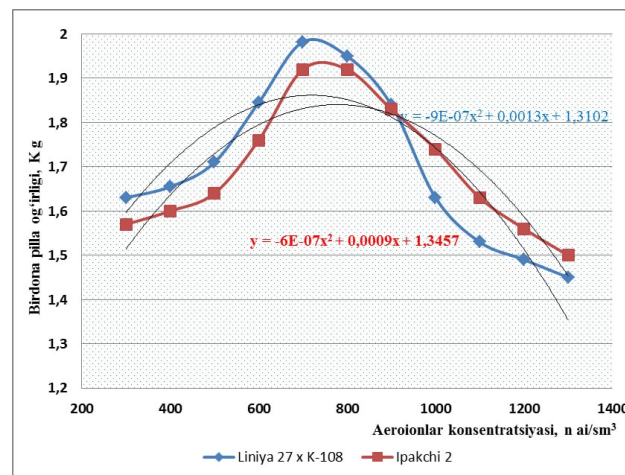


Figure 1. Dependence of the concentration of aeroions on the weight of one piece of sawdust of Foreign "Liniya 27 x K-108" and domestic "Ipakchi 2" hybrids

In experiments, aeroion content was conducted in the range from 200 ai/cm³ to 1300 ai/cm³. In this electrotechnological method, there was no spread of diseases in the process of animating and caring for mulberry silkworm seeds, since, in addition to animating mulberry silkworm seeds and cleaning the care facility from various microorganisms, bacteria, increased the amount of useful negative aeroions in the air, and the development of mulberry silkworm was positively influenced. Based on the results of the experiment in the form of a graph in 1-picture Above, It can be seen that the heaviest saws were obtained from 500 ai/cm³ at 700 ai/cm³.

In the process of breeding mulberry silkworm seeds, aeroion contentation was carried out in the

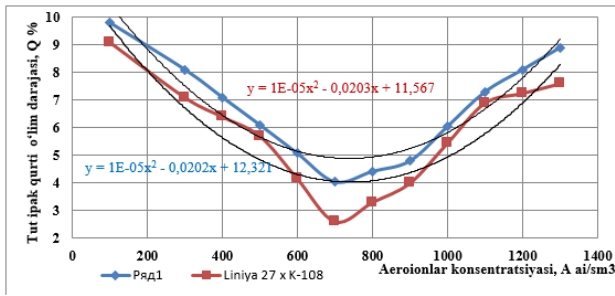


Figure 2. Foreign “Liniya 27 x K-108” and domestic “Ipakchi 2” hybrids, the dependence of high vitality on the concentration of aeroions

range from 200 ai/cm³ to 1300 ai/cm³. When the concentration of aeroions is maintained at 500–700 ai/cm³, worm mortality can be seen to be less observed.

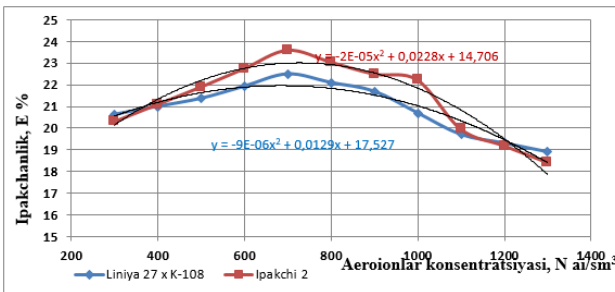


Figure 3. Dependence of the cocoon silkiness indicator of Foreign “Liniya 27 x K-108” and domestic “Ipakchi 2” hybrids on the concentration of aeroions

The electrotechnology studied has also shown itself to have a positive effect on the silkiness of the cocoon. In this, in 3-picture experiments were carried out in the process of breeding mulberry silkworm seeds, the content of aeroions was carried out in the range from 200 ai/cm³ to 1300 ai/cm³. The experimental aeroion concentration with the best silkiness was found to be 23.6% of silkiness of the cocoons grown at 500–700 ai/cm³, while the current method found that the lowness of some time was 20.61%.

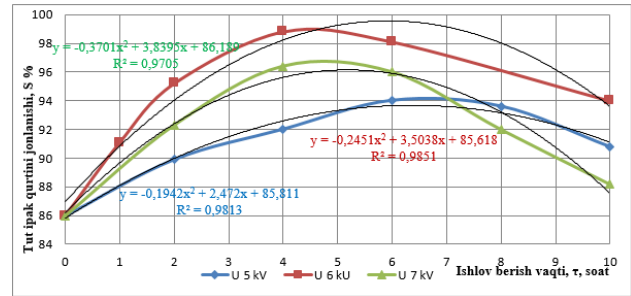


Figure 4. The dependence of time in aeroionization on the revival of Foreign “Liniya 27 x K-108” and domestic “Ipakchi 2” hybrids

From a graphical analysis, the following were found. In the process of revitalization and maintenance of mulberry silkworm seeds, it is necessary to reach the processing time, in the process of processing hona muxit with high-voltage back aeroions in artificial enrichment with aeroions. In this case, the concentration of aeroions can be changed by increasing the processing time from 0 to 16 hours. The processing time was 20 minutes every 2 hours, the voltage was 6 kV at 240 minutes per day, the electrode spacing was 20 mm, the aeroion concentration was 500–700 ai/cm³ humidity was 65–75%, and the temperature was 25–27°C. Mulberry silkworm seed has increased vitality, nutrition, vitality, productivity and quality indicators.

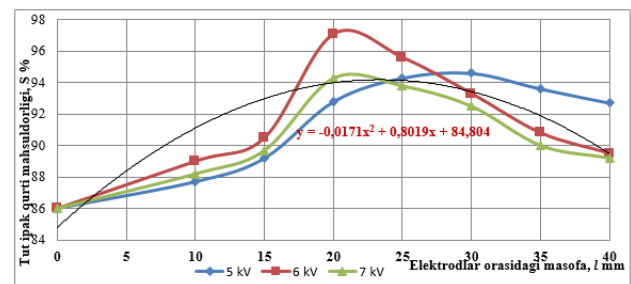


Figure 5. The dependence of Foreign “Liniya 27 x K-108” and domestic “Ipakchi 2” hybrids on the distance between the aeroionizer electrodes during the revitalization process

Through the analysis of the results of the experiment in the form of a graph, the following were determined. In the cultivation of flax, it is important to take into account the distance between the electrodes when producing a crown discharge when processing by a variable electrotechnological method. The change in distance between the electrodes affects the amount of concentration of

the aeroions. The functional relationship to the distance between electrodes in the production of quality and specialty flax has been studied, and the following indicators have been identified. In experiments, the distances between the electrodes were carried out in the range from 10 mm to 35 mm. The results of the experiments show from the graph that the electrode range was 20 mm, the voltage was 6 kV, the processing time was 240 minutes every 2 hours for 20 minutes per day, the concentration of aeroions increased by 700-900 ai/cm³ humidity 65-75%, and the temperature was 25-27o mulberry silkworm seed revival, the viability of worms increases to 23.4

RESULTS AND DISCUSSION

Based on the expert studies carried out, the mathematical model of mulberry silkworm seeds, which represents the level of productivity under the influence of artificial aeroionization of the living room air, comes into view as follows:

$$S = 81.64 + 1.67n - 1.98\tau - 164.373r + 0.019n\tau - 5.211nr + 4.98r + 0.0006n^2 + 0.061\tau^2 + 139.2 \quad (1)$$

On the basis of regression and dispersion analysis of the mathematical model, all its coefficients are relevant, and the mathematical model represents the process with an adequate one.

Studies have identified the following optimal parameters of the building air artificial aeroionation process in which mulberry silk seeds are animated and cared for: Aeroion concentrate 600 aer/cm³, artificial aeroionation time 4 hours and aeroionation dispersion radius 3 meters. In these parameters, the survival rate of the mulberry silkworm, whose air is animated in an aeroionized wormhole, is 98.6%, and its vitality is 95%.

CONCLUSION

The limits and ranges of variation of the most important factors for conducting multi-factor experiments in determining optimal values in experimental studies of silkworm seed revitalization, aeroion treatment in the breeding process in increasing the efficiency of saw

production have been identified. In particular, the processing voltage is $U = 6000$ V, the processing time is $t = 4$ hours, and the distance between the electrodes is $l = 20$ mm.

Silkworm seed revitalization has been found to improve saw quality indicators to 4A by 10-12% revitalization of mulberry silkworm seed and 8-10% increase in worm viability through aeroion treatment in the breeding process, and to increase Live saw silkiness to 2-3%.

Using the Dispersion multi-factor analysis method, a mathematical model of the process of animating silkworm seed, processing with aeroions in the breeding process was created, and it was found that it can be perceived in the form of a level function.

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