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SUMMARIES

STILLING BASIN HYDRAULIC MODE AND PULSATING LOADS ON A SLAB.

M.Sanikidze.

"Energy". №2(102). 2022. Tbilisi. p.5-12. geo. sum geo. engl. rus.

In general, the design of hydropower plants is mainly limited to the coupling of hydropower streams and only hydraulic calculations are performed in this regard. The practice of operation of hydraulic structures has shown the inadequacy of such an approach. It is also important to determine the energy shortage and pulsating pressures acting on the energy basin slab when designing.

The paper presents an analysis of the coupling of the culverts in connection with the rehabilitation of the demolished slab of the Tsageri hydroelectric dam, as well as the results of the loads developed on the slab of the energy quench well. Numerical results of the calculation were obtained using classical solutions, including the Freud number. Based on the results of the experimental study, the energy shortage as well as the distribution of pulsating pressures on the water energy basin slab was obtained.

Ill. 8, foto 1, tabl. 1, bibl. 2.

THE CURRENT STATE OF DEVELOPMENT OF THE DESIGN OF RECTIFIER TRANSFORMERS WITH HIGH-TEMPERATURE SUPERCONDUCTING WINDINGS.

M.Khakhanov.

"Energy". №2(102). 2022. Tbilisi. p. 13-18. geo. sum geo. engl. rus.

Three main structural blocks of rectifier transformers with high-temperature superconducting windings are considered, namely: cryostat, windings, magnetic core. The advantages and disadvantages of the "warm" and "cold" magnetic systems of HTS transformers are discussed; as well as constructive features regarding the thermal insulation of the windings of these transformers. Conclusions are made when using new HTS transformers. Special attention is paid to the problem of implementing the function of limiting emergency overcurrents in such transformers.

Bibl.6.

INFLUENCE OF CONTAINER CONSTRUCTION ON THE FORMATION OF VINE SEEDLINGS AS GREEN SEEDLINGS. NEW ENERGY SAVING METHOD AND COMBINATIONS OF NURSERY MATERIAL SANITATION.

R. Gotsiridze, N.Lomidze.

"Energy". №2(102). 2022. Tbilisi. p.19-27. geo. sum geo. engl. rus.

The article briefly presents a novel construction of the container "Challenger" patented in Georgia and its influence on the process of cultivation of grapevine seedlings, and discusses the results of observations of the plants cultivated in "Challenger" in comparison with traditional pots. The observation materials clearly show the advantages of "Challenger" compared to the traditionally used containers. "Challenger" can be used with an especial success to propagate vineyards using formation of vine cuttings into seedlings. It is known that in the process of plant seedling formation prevention of contamination of seedling material by pathogens is of great importance, which is now usually carried out by processing the nursery material with hot water or using material obtained by long and expensive constantly controlled selection. Both of these routes require significant energy and financial costs and are often difficult to access by small and medium producers in Georgia. One of the optimal ways to quickly solve this problem may be to use electrochemically activated aqueous solutions and high-energy multicomponent mixtures of biologically active oxide nanoparticles.

Ill. 4, diagr. 4, tabl. 1, bibl. 7.

CULTIVATION OF PISTACHIO (PISTACIA VERA L.) PLANTATIONS IN GEORGIA: PROSPECTS AND OPTIMAL APPROACHES. ENERGY-SAVING METHODS AND FORMULATIONS FOR PREVENTION OF CONTAMINATION OF SOURCE MATERIAL FOR GROWING SEEDLINGS WITH VARIOUS PATHOGENS.

J. Dzlierishvili, N.Lomidze.

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Pistachio (*Pistacia vera* L.) is one of the most expensive nut crops in the world, the demand for which is constantly increasing. The interest of Georgian farmers to this crop is growing all the time, and today there are many pistachio plantations in Georgia. This circumstance is also due to the fact that the pistachio is one of the best means of combating desertification and is highly productive even under conditions in which other plants quickly die. Pistachio is widely distributed in arid regions and, in addition to its naturally strong branched root system, is endowed with a unique ability to survive and bear fruit in semi-desert conditions. The pistachio acquires the properties necessary to survive in arid conditions at an average age of 2 years after the emergence of sprouts. Therefore, for optimal transplantation of seedlings grown in greenhouses and their safe development at the age of up to 2 years, it is necessary to use optimal agrotechnical approaches and methods. For the profitability of the management, energy-saving and economical means of protecting planting material from pathogens are also of great importance. At present, it is customary to treat the source material with a 0.1% aqueous solution of hydrogen peroxide or hot water at with temperature $\chi\jmath$ (50-55°C). The second, more effective and common method is to carefully check the contamination of the source materials to avoid pathogens and create collections of pathogen-free nursery material. Both of these methods require extremely high energy consumption and are quite expensive. At the present stage, it is believed that the combined use of electrochemically activated antiviral aqueous solutions and environment friendly water dispersions of nanoparticles (CuO, Al₂O₃), which at the same time cause significantly less stress in plants than the hot water, has a high protective potential. A joint research showed that combinations of aqueous dispersions of CuO/Al₂O₃ nanoparticles with an electrochemically activated preparation "Elixir for nuts and nut crops" are characterized by particularly low acute toxicity to living organisms.

Ill. 2, bibl. 9.

IMPORTANCE OF GRAFTING AND EFFECTIVE METHODS OF GROWING REAL PISTACHIO (PISTACIA VERA L.) IN GARDENS AND PLANTATIONS IN GEORGIA. ENERGY-EFFICIENT METHOD AND NEW PREPARATIONS FOR PROTECTING PLANTING MATERIAL FROM PATHOGENS.

J. Dzlierishvili, N.Lomidze.

"Energy". №2(102). 2022. Tbilisi. p.38-50. geo. sum geo. engl. rus.

The distribution of true pistachio (*Pistacia vera* L.) is most intensive in the regions of Kakheti, Shida Kartli and Kvemo Kartli. Pistachio (*Pistacia vera* L.) begins to bear fruit at the age of 7-8 years, and reaches full maturity at the age of 25 years. Reduction of the time for the onset of fruiting of this fista (*Pistacia vera* L.) is carried out by grafting. A female bud, grafted on a 2-year-old seedling, gives the first fruits in 2-3 years. Grafting also increases the quantity and quality of the pistachio crop, as well as maintaining the right ratio of female and male seedlings for optimal pollination. To ensure the economic sustainability of the cultivation of real pistachio (*Pistacia vera* L.) in Georgia, the high energy efficiency of protecting the nursery material is of fundamental importance, which can be achieved as a result of replacing the conventional method of processing the source material with hot water by an innovative method using new types of combined preparations based on electrochemically activated aqueous solutions and liquid aqueous dispersions of biologically active nanoparticles. It is also important to reduce the acute toxicity of the drugs used, which in this study was assessed by the method of ovoscopy according to their effect on the development of chicken embryos.

Ill. 9, bibl. 7.

SLOPE-FIXING ASSEMBLING REINFORCED CONCRETE STRUCTURES MADE OF LIGHT POLYMER-SHELL-CONCRETE.

M. Lordkipanidze, T. Jojua.

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For the purpose of reducing the weight of the protection structures on the slope and increasing their durability, replacement of the heavy concrete by a new light-weight concrete – polymer-shell-concrete - within them was suggested.

New experimental studies of the slope fixing structures showed that the structures made of the mixture of bakelite lacquer and 10% epoxide glue, regardless of their reduced zises, have 30% less weight than the heavy concrete and are stronger, more durable, water resistant, frost resistant and resistant against aggressive environment.

Also, 12m hollow-body prestressed reinforced concrete panels made of light polymer-shell-concrete were tested and a possibility of their utilization in the construction of large buildings was determined.

For industrial development of the production of products from polymer concrete on natural porous fillers, "instructions on the technology of production of products from polymer concrete on natural porous fillers" have been elaborated by us.

Ill. 2, bibl. 4.