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Technology For Increasing The Efficiency and Quality Of Defoliant

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Abstract:

The article presents the results of scientific research on the technology of obtaining a new diquatetetraurea chlorar calcium preparation used for shedding cotton leaves. For artificial shedding of cotton leaves, it is necessary to use effective drugs with high defoliation activity, that is, effective drugs that shed at least 90-95% of leaves after treatment with a small amount of the drug. In addition, the drug used should have a mild effect on cotton, should not reduce its productivity, should not pollute the cotton fiber, and should not have a negative effect on the quality indicators of the seed, and should be made from easily available and cheap raw materials. In this regard, research was conducted on the development of a new high-efficiency defoliant technology based on calcium chlorate-chloride and urea, which is used as a nitrogen fertilizer, and we developed a new drug technology./1/

Kalit so‘zlar. Agrotechnical activities, defoliation, defoliants, defoliation activity, effective preparations, desiccation, calcium chlorate-chloride, nitrogen fertilizer, system, urea, technology, preparation technology, physical and chemical properties, crystallization and filtration, vacuum filter, reactor, drying, packaging, conversion.

Introduction.

One of the factors that allows to pick and collect the cotton crop grown in the cotton fields of our republic in a short and convenient period without damage is the shedding of cotton leaves with the help of chemical preparations, i.e. defoliation. Cotton growing is one of the main branches of agriculture in our country, and picking and harvesting the harvested crop on time is one of the urgent issues. The solution to this problem depends on the agrotechnical measures taken before harvesting

the cotton crop, one of the main measures of which is the artificial shedding of cotton leaves with the help of effective preparations./2/

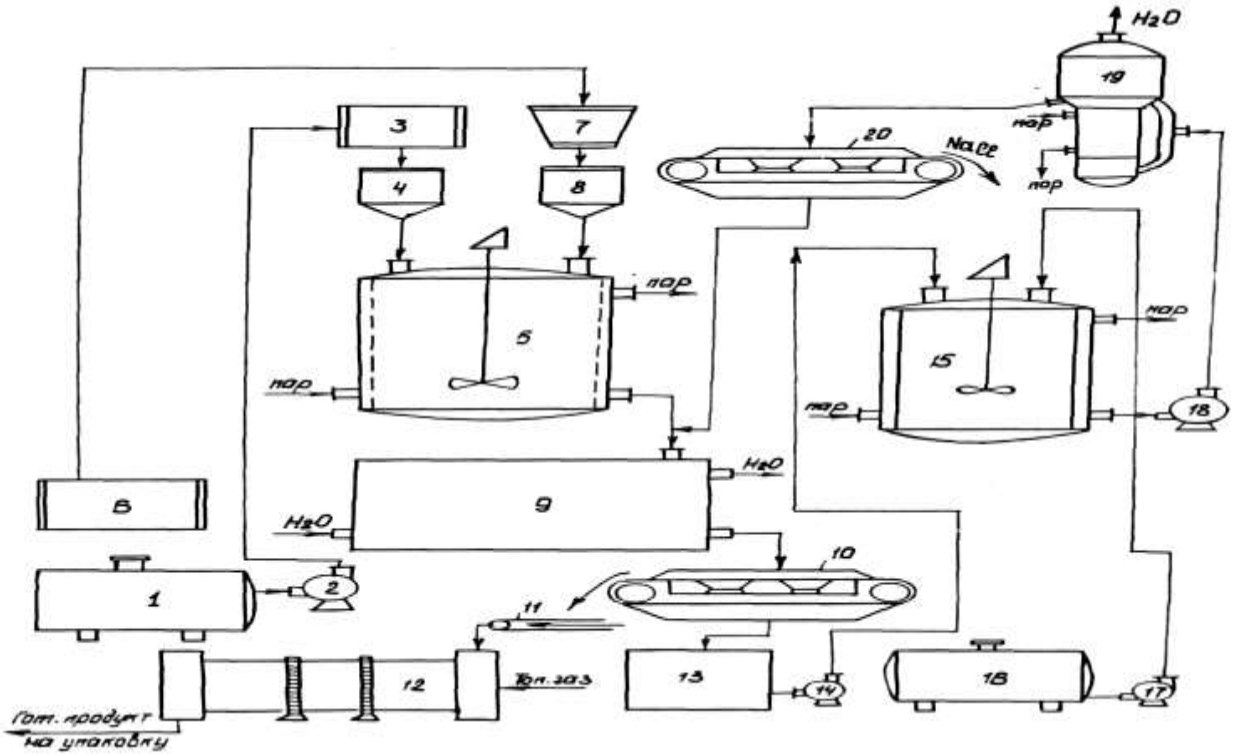
For artificial defoliation of cotton leaves, it is necessary to use effective drugs that are prepared from easily available and cheap raw materials with high defoliation activity, and at least 90-95% of cotton leaves should be shed after treatment with a small amount of drug. In addition, the drug used should have a gentle effect on cotton, not reduce its yield, not pollute cotton fiber, and not have a negative effect on the quality of the seed. Because in our Republic, it is necessary to process cotton seeds and produce high-quality vegetable oil for the food industry. If it damages the cotton seed, it will have a negative effect on meeting the population's demand for vegetable oil./3/

In this regard, we conducted a research on the development of a technology for obtaining a new, high-efficiency, high-quality defoliant with a mild effect on cotton seed and fiber based on low-efficiency chlorate-chloride calcium defoliant and urea, which is used as a nitrogen fertilizer and developed a new drug production technology. /4/

Materials and methods. The technological processes of obtaining defoliant are based on the physical and chemical properties of the following systems:

1. $Ca(CLO_3)_2$–$CaCL_2$–$CO(NH_2)_2$–H_2O system, 2.$CO(NH_2)_2$–(52,0% $Ca(CLO_3)_2$+48,0% $CaCL_2$)–N_2O system and 3.$CO(NH_2)_2$–(20,0% $Ca(CLO_3)_2$ + 26,0% $CaCL_2$ + 54,0% N_2O)–N_2O systems. From the data obtained as a result of the study of these systems, it was found that to obtain the defoliant, which is the main product, by slowly adding 46.0% urea to the selected chlorate-chloride calcium solution and mixing evenly, the compound formed by reacting should be crystallized. A new crystallizing compound was isolated, and after its novelty was confirmed, the new compound formed (CaCL2 * 4 CO(NH2)2*2H2O) was named calcium diquatetraurea chlorate, and its crystallisation area is shown in the diagram of the system (CaCL2 * 4 CO(NH2)2) and we used the isothermal diagrams of the chlorate-chloride calcium-urea-water system at temperatures of 10, 20 and 30°C. In order to saturate the calcium chlorate-chloride solution, we converted the solution with chlorate sodium salt and evaporated it to Ca(CLO3)2 : CaCL2 = 1.191:1.00 ratio./5,6/

Results and their analysis. As a result of the above research, the technology of obtaining a new preparation with high efficiency was developed. (Figure 1).



Picture - 1. Technological scheme of taking the drug.

1-capacity for calcium chlorate-chloride solution; 2,14,17,18-centrifugal pumps; 3,13-intermediate capacities; 4, 8-dosing devices; 5-reactor; 6-urea storage; 7-loading bunker; 9-crystallizer; 10, 20-tape vacuum filters; 11-transporter; 12-drying drum; 15-mixing reactor; 16-storage capacity of calcium chlorate solution; 19-evaporation apparatus.

Based on the studied technological researches, the sequence of the preparation process was created as follows:

- adding and dissolving urea in calcium chlorate-chloride solution;
- crystallization and filtration of the product;
- solution conversion and evaporation;
- product drying and packaging.

The calcium chlorate-chloride solution comes from the tank (1) using centrifugal pumps (2), through the tank (3) and passing through the regulator (4) to the reactor (5). Urea-filled bags are taken from the warehouse (6) through the loading hopper (7) and past the dosing unit (8) into the reactor (5).

It should be noted that the dissolution of urea is an endothermic process, which takes place with the absorption of heat. Therefore, the temperature in the reactor jacket is higher. A mixer is installed in the reactor, and the temperature during the melting process is 55-60ºC.

After dissolving urea, a solution of ratio Q(thick):S(liquid)=1.7:2.0 is formed. The crystallization temperature of the product is 50.2°C and the specific mass is 1.398 g/cm3. The ready solution comes to the crystallizer (9) and is crystallized using cold water at a temperature of 20°C for 4-5 hours. The resulting thin film is filtered using a vacuum filter (10). The separated solid phase is transferred to the drying drum (12) through the conveyor (11) and dried. The dried product is placed in polyethylene bags with a capacity of 25 dm^3 or 50 dm^3, the mouth is closed and sent to the warehouse of finished products for storage until the season.

Conclusion. Based on the technology developed as a result of scientific research, a new and effective drug called "Hayat" was developed. The prepared drug was distributed to the specified test

areas and its effects on cotton, cotton fiber and seed were studied and it was found that the new defoliant is of high quality and effective.

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