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Changes in the Efficiency of Cotton Cleaning From Minor and Major Dirties During the Drying and Cleaning Processes

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ABSTRACT. In this article on three versions were identified the effective cleaning of the Sultan selection cotton sort from minor and major dirties by various technological processes, and the optimal technological process was recommended for production.

KEYWORDS: minor and major dirtiness, efficiency of cleaning, selection variety, ginning device

I. INTRODUCTION

In the cotton ginning plants receiving high quality cotton seeds, drying it at high temperatures and carrying out multiple cleaning operations also shows negative results too. As a result, the structure of the cotton fiber worsens, and mechanical damage to the cotton fiber increases the number of short fibers, reducing the strength and length of the fiber, causes getting yellowish. In addition, this change will have a negative impact on the textile industry, such as knitting, combing, paving and welding, spinning, which will worsen the quality of the products [1-3].

The cleaning process is also important to maintain the quality of cotton accepted to cotton ginneries. Because during the cleaning process, fiber or seeds can cause various injuries, resulting an increase in the number of accidents in the subsequent processes, and poor quality of the fiber. Therefore, the organization of the cleaning process based on the determined chain system will improve the quality of the product. If the moisture of the cotton is higher than the standard values, it will not be well cleaned from minor and major dirties and the efficiency of cleaning will be reduced, which will adversely affect the quality of fiber, yarn and its products, thus the finished products may be defective. Therefore, any amount of moisture in cotton-ginning factories is dehydrated to the standard set humidity and is subsequently involved in the cleaning process [4-6].

There are several types of cleaning devices in the cotton ginneries of our Republic, which differ from each other [7].

In the dry cleaning workshops of cotton plants the initial moisture of the 1st and 3rd sorts should be 11% and the lower sort of cotton not more than 13%.

This is due to the fact that quality of the fiber during the cotton storage process worsens or burns [8].

During the cotton cleaning season, humidity is of the greatest importance. The more moisture content, it is difficult for the separating of defects, which leads to an increase in the number of damaged or injured seeds [10]. For this reason, the moisture of the cotton received at the ginneries and preparing places should not exceed 11% for the first sort and 13% for the lower sorts. If the moisture before the ginning equipment is in the range of 7-8%, the quality of the cotton fiber will remain [9].

Installation of six-drum cleaning equipment at the cotton gin plants increased the purity of the C-4727 sort by 16% compared to the 6A-12M, and the cotton sort 8763-I by 30%. After the cotton cleaning, defects in the seeds were poorly formed, with 0.3-0.5% deficiency in the fiber and the amount of waste due to the depletion of the rough and complex fibers [1].

In recent years, cotton plants operating in our country are switching to cluster systems. This will improve the quality of the product. First of all, a reduction in technological processes and an optimal process of obtaining high quality products will be developed when transitioning to an enterprise cluster.

II. METHODOLOGY

Therefore, the cotton ginning plants in the cluster system were used to determine the effectiveness of cotton cleaning from minor and major contaminants in Option 1 - from piling to rolling, option 2-from piling to fiber cleaning, and Option 3 from cotton harvesting and to rolling, testing results are shown in Fig. 1. and Fig. 3.

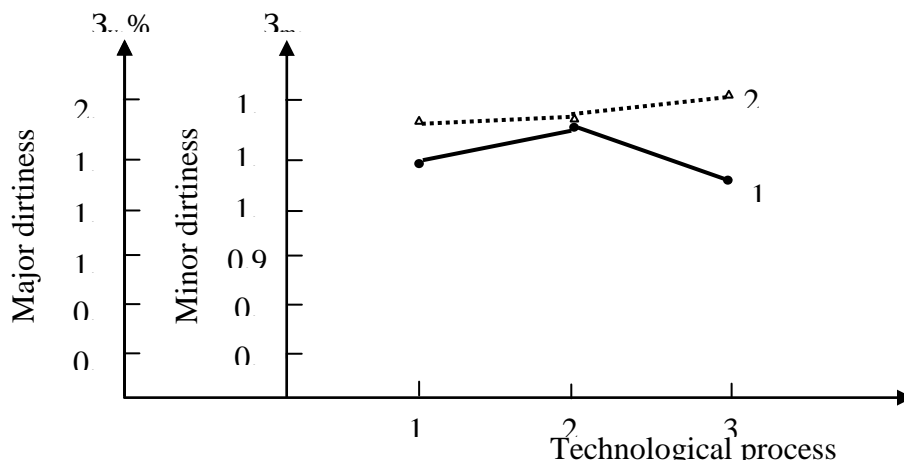


Figure 1. Changes in the efficiency of cleaning cotton harvest from minor and major dirtiness.

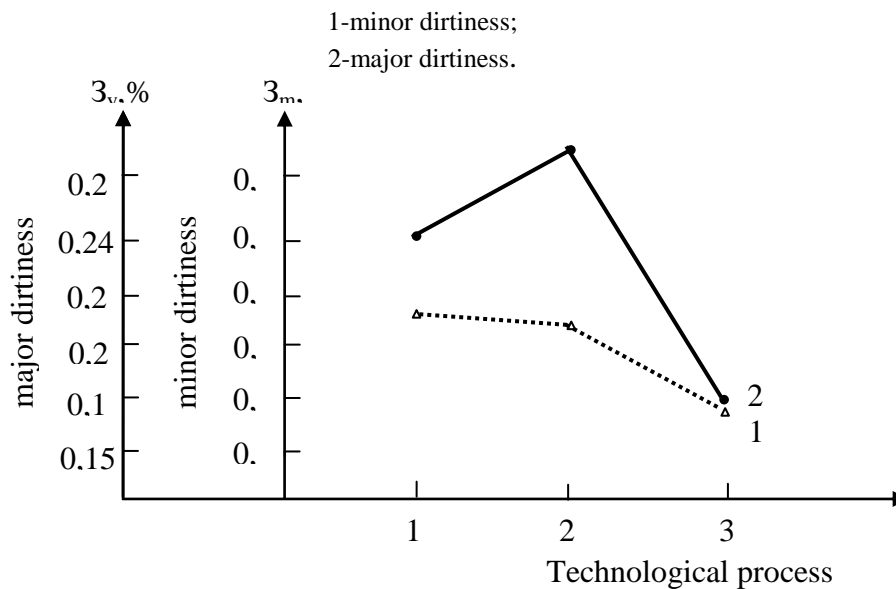


Figure 2. Changes in the efficiency of cotton cleaning from minor and major dirtiness after cleaning.

1-small rubbish;
2-large rubbish.

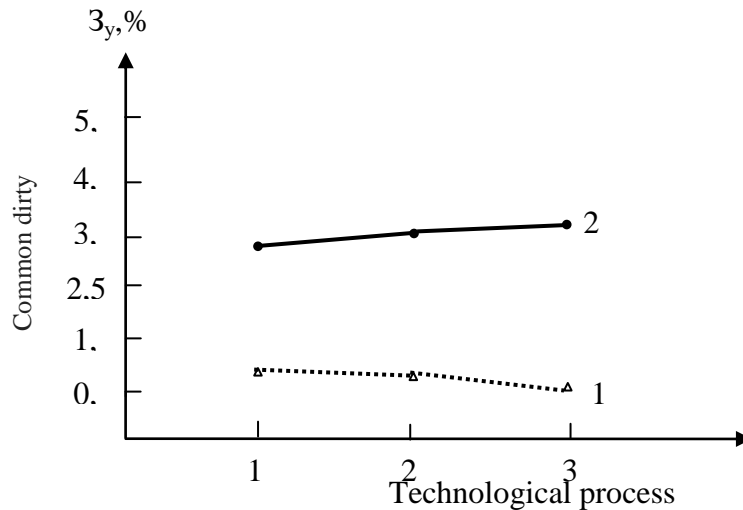


Figure 2. Changes in the efficiency of cotton cleaning from general contamination.

1-after cleaning;
2-cotton in harvesting.

III. RESULTS AND DISCUSSION

The results of the experiment show that compared with the indicators of efficiency of cotton cleaning, according to Option 1, the total amount of dirtiness after cotton cleaning increased by 74.4%, major dirtiness by 55.4%, minor dirtiness by 87.4%. Compared to the indicators of the efficiency of cotton cleaning, the total amount of dirtiness after the cotton cleaning process is 76.4, minor dirtiness by 63.6%, major dirtiness by 85.8%, comparison of the efficiency of the cotton cleaning according to the variant 3, the total amount of dirtiness after the cotton cleaning is 84.6%, the amount of minor dirtiness is 70.0%, there was an increase in the number of major dirtiness by 93.0%

The results of the research show that the efficiency of cotton cleaning increased dramatically as a result of reduced technological processes at the cotton-ginning factory and failure to keep cotton. In addition, due to reduced technological processes, the quality of fiber and seeds remains.

IV. CONCLUSION

According to analysis of the results, if the harvested cotton in the field without the direct drying process, the total amount of dirtiness after the cotton cleaning process was increased to 84.6%, minor dirtiness 70.0%, and major dirtiness 93.0%. It is especially noticeable that the efficiency of cotton cleaning from major dirtiness has increased dramatically, because if we keep the cotton at a high density, the amount of large contaminants in the compressed cotton can turn into minor dirtiness. As a result, cotton contributes to the growth of minor dirtiness.

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