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The Effect of Temperature and Humidity on Change of Fabric Class

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ABSTRACT: In this article, the contamination class of cotton fiber was studied by drying Beshkahramon selection varieties regionalized in Kopaysin, Navruz and Surkhandarya regions of Syrdarya region at a temperature of 120⁰S, 140⁰S and 160⁰S and a humidity of 8-9%.

KEY WORDS: fiber content and amount of waste, fiber class, tangled and complex tangled fiber, cored fiber, mechanically damaged seed, small and large defects

I. INTRODUCTION

Raw materials collected from the cotton fields of the country will be handed over to ginners and ginners. In order to store cotton received from farms for a long time and to obtain high-quality fiber and seeds from it, it is necessary to store it in a bunch according to the moisture content, taking into account the type and grade of cotton.

Cotton stored in ginneries is first dried in drying mills, cleaned of weeds, separated from the fiber by machines and aggregates in a series of machines in the technological system of the enterprise, and then ginned with the help of high-capacity units, and then sent to textile enterprises, production plants.

Given the processing of the drying and cleaning department at the ginnery, it is advisable to dump cotton with a moisture content of up to 14% on the territory of the ginning department and cotton with a moisture content of more than 14% on the territory of the ginning department. In addition, after the cotton harvested at high humidity is brought to the processing plants, it is dried to an additional humidity before the initial processing, and then ginned. If the moisture content of cotton is higher than the standard values, the color of the fiber will turn yellow, quality indicators will decrease, and in some cases even lead to signs of fire. Therefore, low-grade cotton with higher than standard moisture content is primarily involved in processing. Underground passages open from the lower parts of the ginned cotton.

The cleaning process is also important to maintain the quality of the cotton received. Because the fiber or seed can be damaged in the cleaning process, as a result, the number of accidents in the subsequent processes will increase spontaneously, the quality of the fiber will deteriorate. Therefore, organizing the cleaning process on the basis of a defined chain allows you to improve the quality of the product.

One of the main properties of cotton fiber is the amount of defects and waste in its composition.

The price and grades of cotton fiber are assessed according to the level of impurities. Cotton fiber is divided into high, good, medium, normal and dirty classes according to the standard pollution level. The lower the impurity class of the fiber, the lower its price.

The increase or decrease in the amount of contaminants and defects in the cotton fiber in ginneries depends on a number of factors, ie during the ginning of cotton, the volume of contamination in the lower part of the gin and the amount of small defects increases. The amount of small defects increases and the amount of large defects decreases. As a result, cleaning from minor defects leads to a decrease in efficiency.

As a result of drying the seed cotton at high temperature and low humidity during the drying process, the cleaning efficiency of the seed cotton is high. If the moisture content during the drying of the seed cotton is higher than the standard values, the cleaning efficiency will decrease. In addition, the amount of pollution is reduced due to repeated cleaning of seed cotton in ginneries. At the same time, if we carry out repeated cleaning of seed cotton, the amount of defects and waste in the cotton fiber will increase due to the increase in the number of twisted, complex twisted fibers and beaten or injured seeds. In addition, the seeds that are hit or injured during the separation of the fiber from the seed, the amount of bark fiber increases.

II. METHODOLOGY

Moisture content plays a very important role in cotton ginning plants. If the moisture content of the seed cotton is high, the amount of fiber content and waste will increase. Therefore, the drying process is used.

In order to maintain the contamination class of cotton fiber, different selection varieties were dried to different temperatures and humidity, and the amount of defects and waste in the obtained fiber content was determined. The test results obtained are presented in Tables 1-3.

Tables 1

Influence of temperature and humidity on the change of pollution class of cotton of Navruz selection variety

№	Indicators	Drying temperature of cotton, °C			
		Cotton in the pile	120	140	160
1.	Total defect and amount of waste, %	3,62	2,67	2,52	2,37
2.	combined fibers	0,08	0,17	0,12	0,02
3.	complex composite fibers	0,06	0,08	0,12	-
4.	ineffectual and whipping seeds	0,54	0,32	0,38	0,62
5.	raw fiber	0,16	0,12	0,12	0,11
6.	peel with fiber	0,28	0,34	0,40	0,52
7.	nodules	0,04	0,09	0,10	0,14
8.	contamination	2,46	1,60	1,28	0,96

Tables 2

Influence of temperature and humidity on the change of pollution class of cotton fiber of the most selected variety

№	Indicators	Drying temperature of cotton, °C			
		Cotton in the pile	120	140	160
1.	Total defect and amount of waste, %	3,49	2,73	2,47	2,57
2.	combined fibers	0,10	0,12	0,04	0,02
3.	complex composite fibers	0,02	0,03	0,06	-
4.	ineffectual and whipping seeds	0,52	0,44	0,30	0,58
5.	raw fiber	0,16	0,10	0,14	0,11
6.	peel with fiber	0,34	0,40	0,42	0,58
7.	nodules	0,06	0,10	0,11	0,16
8.	contamination	2,29	1,54	1,23	1,12



Tables 3

Influence of temperature and humidity on change of pollution class of cotton fiber of five-choice selection variety

№	Indicators	Drying temperature of cotton, °C			
		Cotton in the pile	120	140	160
1.	Total defect and amount of waste, %	3,94	2,82	2,77	2,66
2.	combined fibers	0,12	0,10	0,08	0,01
3.	complex composite fibers	0,02	0,02	0,02	-
4.	ineffectual and whipping seeds	0,40	0,40	0,32	0,54
5.	raw fiber	0,10	0,12	0,11	0,12
6.	peel with fiber	0,30	0,42	0,50	0,62
7.	nodules	0,06	0,10	0,10	0,13
8.	contamination	2,54	1,66	1,43	1,24

Based on the results in the tables above, Figures 1-4 show graphs of changes in the fiber content and waste of different selection varieties under the influence of different temperatures and humidity.

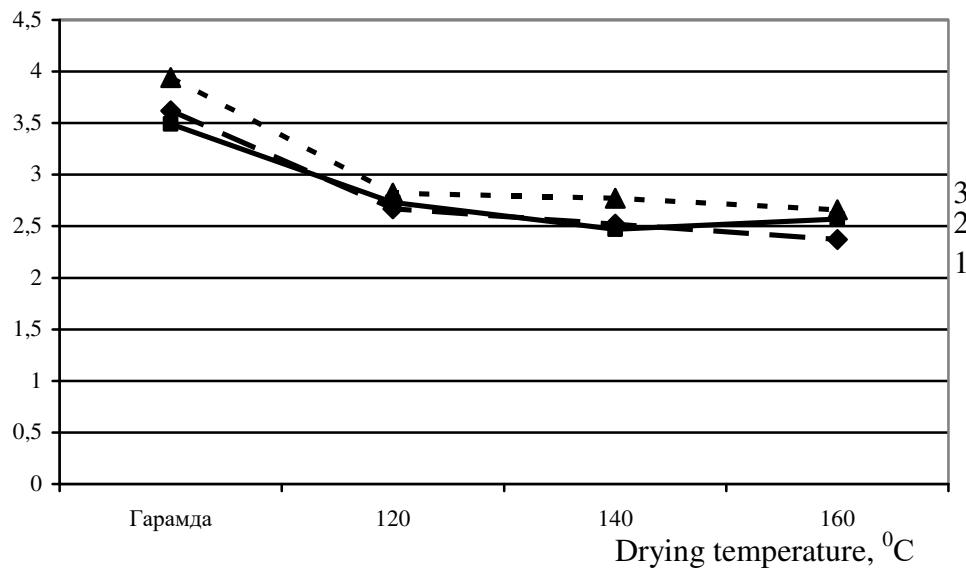


Figure 1. The effect of drying temperature and humidity on the amount of total impurities in the fiber content.

- 1-Kopaysin the selection variety;
- 2- Beshkahramon the selection variety;
- 3- Navruz selection variety.

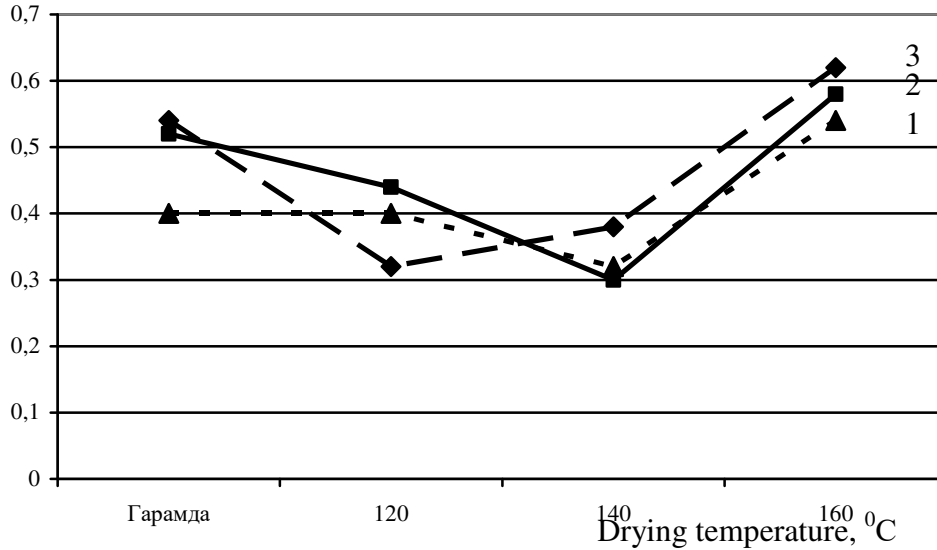


Figure 2. The effect of drying temperature and humidity of cotton on the amount of beaten or injured seeds in the fiber content.

- 1- Kopaysin the selection variety;
- 2- Beshkahramon the selection variety;
- 3- Navruz selection variety.

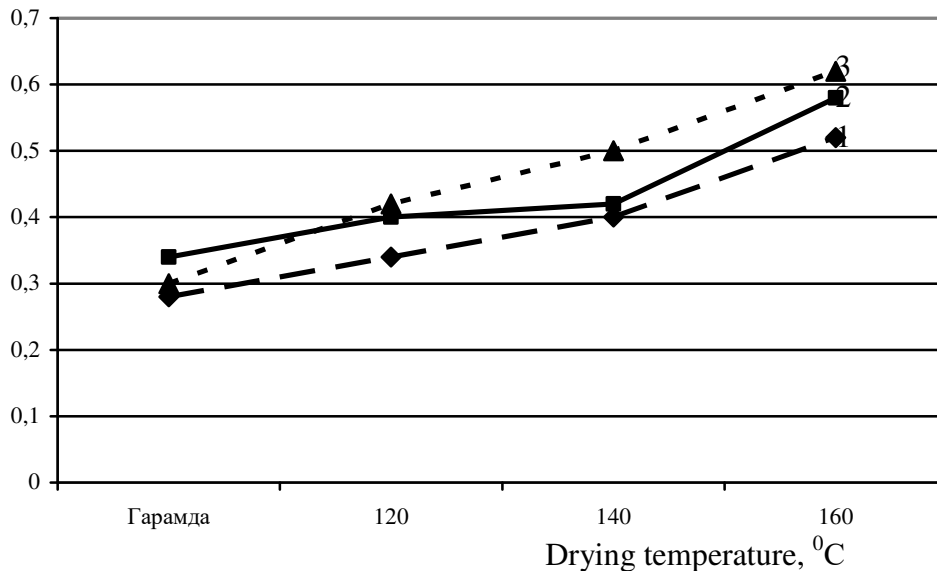


Figure 3. The effect of drying temperature and humidity of cotton on the amount of husk fiber in the fiber content.

- 1- Navruz selection variety;
- 2- Beshkahramon the selection variety;
- 3- Kopaysin the selection variety.

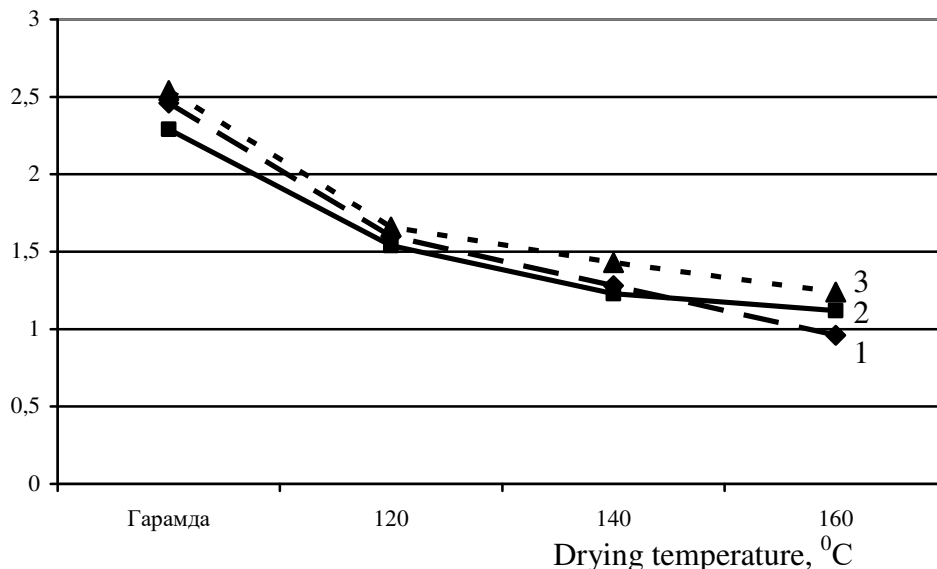


Figure 4. The effect of drying temperature and humidity on the amount of impurities in the fiber.

- 1- Kopsaysin the selection variety;
- 2- Navruz selection variety;
- 3- Beshkahramon the selection variety.

III. RESULTS AND DISCUSSION

Analysis of the results of research on the purity of fiber in the process of drying temperature and humidity in the ginning plant showed that when we select cotton of different varieties and dryness at different temperatures and humidity around 8-9%, compared to the purity class of cotton fiber the total amount of defects and waste decreased by 26.2%, the amount of crushed or injured seeds decreased by 44.4%, the amount of husk fiber increased by 17.6%, the amount of impurities decreased by 35.0%, the total fiber content decreased when drying cotton at 140°C and the amount of waste decreased by 30.4%, the amount of crushed or injured seeds decreased by 29.7%, the amount of hull fiber increased by 30.0%, the amount of impurities decreased by 48.0%, the total fiber content and waste when drying cotton at 160°C amount decreased by 34.5%, the amount of crushed or injured seeds decreased by 12.9%, the amount of bark fiber increased by 16.2% increased, the amount of contaminants decreased by 61.0%.

The change in the purity class of the fiber under the influence of temperature and humidity was also observed in the cotton fiber of the Kopsaysin selection variety. Compared to the purity class of cotton fiber stored in the warehouse, when cotton was dried at 120°C, the total fiber content and waste decreased by 21.8%, the amount of crushed or injured seeds decreased by 15.4%, the amount of husk fiber increased by 15.0%. the amount of impurities decreased by 32.8%, the total fiber content and waste when drying cotton at 140°C decreased by 29.2%, the amount of sown or injured seeds decreased by 42.3%, the amount of hull fiber increased by 19.1%, the amount of impurities decreased by 46.3%, the total fiber content and waste when drying cotton at 160°C decreased by 26.4%, the amount of crushed or injured seeds increased by 10.3%, the amount of husk fiber increased by 41.4%, the amount of impurities increased by 51, Decreased by 1%.

Drying of cotton at different temperatures was also studied in relation to other selection varieties. For example, when we dry Beshkahramon selection cotton at different temperatures and around 8-9% humidity, compared to the purity class of cotton fiber stored in the cage, when we dry cotton at 120°C, the total fiber content and waste decreased by 28.4%, the amount of crushed or injured seeds unchanged, husk fiber content increased by 28.6%, impurities decreased by 34.6%, total fiber content and waste when cotton was dried at 140°C decreased by 29.7%, beaten or injured seeds decreased by 20.0%, the amount of husk fiber increased by 40.0%, the amount of impurities decreased by 43.7%, the total amount of fiber defects and waste decreased when cotton was dried at 160°C, the amount of beaten or



injured seeds decreased by 25.9%, husk fiber the amount increased by 51.6%, the amount of pollutants decreased by 51.2%.

IV. CONCLUSION

Analysis of the results of the study showed that if we dry cotton of different selection varieties at different temperatures and different humidity, Navruz and Kopaysin selection varieties at a temperature of 160⁰C, Beshkahramon selection cotton at 140⁰S temperature, the fiber pollution class is higher.

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