EFFECTIVE CLEANING AND GINNING OF LOW-GRADE COTTON IN A SAW GIN

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Abstract. *To increase the gin's productivity by effectively cleaning low-grade cotton from small trash impurities in a saw gin, an industrial-experimental sample of a grate of a new design was produced. The manufactured industrial-experimental sample was installed on a 90-saw gin feeder at the "Boyovut techno claster" LLC cotton ginning enterprise in the Bayavut district of the Syrdarya region, and the gin was improved. Comparative-research work was carried out on a 90-saw gin with a feeder with a mesh surface operating in the workshop with an improved gin. Experimental work was carried out with a distance of 16-18 mm between the spiked drum and the grate bars on the feeder and a distance of 8 mm between the grate bars on the grate bars.*

When cleaning cotton of the 2nd class of the III grade of Sultan breeding on the improved grate feeder of the saw gin at the above-mentioned intermediate distances, the contamination of the cleaned cotton averaged 1.3-1.35%, and the quality of the cotton improved by an average of 0.09 (abs)%-0.07 (abs)% compared to the cleaned cotton on the mesh surface feeder. The cleaning efficiency of the feeder during cotton cleaning averaged 21.7-18.7%, which is on average 2.9 (abs)%-2.3 (abs)% higher than the cleaning efficiency of the feeder with a mesh surface. The fiber contamination after ginning averaged 3.48-3.62%, which is on average 0.12-0.15 (abs)% less than the fiber contamination obtained from gin with a mesh surface feeder. When ginning cotton, the gin's productivity averages 863-916 kg/hour, which is 42-48 kg/hour higher than the existing spiked drum gin.

When cleaning the post-djin fiber on a 5VP cleaner, the fiber contamination averaged 2.93% and 3.0%, the fiber quality improved by an average of 0.21-0.19 (abs)% compared to the fiber produced on a mesh-surface post-djin cleaner, and according to the state standard UzSst 604:2016, grade III belongs to the "Superior" class. As a result of the research work carried out in production, it was studied that the improvement of the gin feeder cleaning with a grate with a long arc length and a

grate gap of 8 mm leads to an increase in the efficiency and productivity of cleaning the gin when cleaning low-grade cotton, improving the quality of the produced fiber.

Keywords: *saw gin, feeder, mesh surface, grate, cleaning efficiency, productivity, cotton, fiber, dirt, quality.*

Introduction. In order to improve the quality of fiber by effective cleaning and ginning of low-grade cotton, drawings of a prototype grate of a new design were prepared in the design department of JSC "Pakhtasanoat scientific center" and an industrial prototype was manufactured at the enterprise LLC "RIM workshop" (Fig. 1). The manufactured prototype was installed on the feeder of a 90-saw gin in the cotton ginning workshop of the "Boyovut techno claster" LLC cotton ginning enterprise in the Bayavut district of the Syrdarya region, and the gin was improved (Fig. 2).

Figure 1. New construction colosnik grille

Based on the positive results obtained under laboratory conditions, production research was conducted at a distance of 16-18 mm between the spiked drum and the grate bars, with a grate spacing of 8 mm [1, 2]. Experimental work was carried out on cotton of the Sultan breed III grade 2 class with an initial moisture content of 13.4% and contamination of 9.6% [3]. In this case, the gin feeder is equipped with grade III 2 class cotton moisture content averaged 9.8%, contamination 1.76% and seed damage in the cotton composition averaged 2.22% [4].

During the research period, to study the cleaning efficiency of the gin feeder-cleaner, the degree of contamination of the cleaned cotton, and the quality of fiber and seeds produced from the gins, samples of fiber and seeds produced from the ginning of cotton from the cleaned cotton in both gin trays were taken and analyzed in the enterprise laboratory. The productivity of gins during cotton ginning was determined by the time study method. In this case, the fiber produced from each gin was taken separately, weighed on scales, and the hourly productivity of the gin was determined.

Figure 1. Appearance in the production of 90 saw gin with an improved colosnik grille

In a 90-saw gin with a mesh surface of the existing design, when cleaning the mesh surface at a distance of 16-18 mm with a spiked drum on the feeder-cleaner of cotton of the 2nd class of the III grade of Sultan selection, the contamination of the cleaned cotton averaged 1.43-1.47%, and the degree of seed damage in the cleaned cotton averaged 2.27-2.25%. In this case, the cleaning efficiency of the feeder-cleaner averaged 18.8-16.4% with the change in intermediate distances of the above-mentioned values (Fig. 3). When ginning cotton, the degree of seed fuzziness after ginning was practically the same with a change in the mesh surface of the spiked drum from 16 mm to 18 mm and averaged 11.2%. In this case, the degree of seed damage averaged 3.47-3.23%. The fiber contamination after ginning averaged 3.6-3.77%. When ginning cotton, the gin's productivity changed from an average of 821 kg/hour to 868 kg/hour. When cleaning the fiber produced from gin in a two-drum fiber cleaner of the 5VP brand, the fiber contamination averaged 3.14-3.19%, and the quality indicator of the produced fiber was III grade “Good” class according to the state standard UzSst 604:2016.

The degree of contamination of the cleaned cotton was on average 1.3-1.35%, and the quality of the raw cotton improved by an average of 0.09-0.07 (abs)% compared to the quality of the raw cotton cleaned on a feeder with an existing mesh surface, when cleaning cotton of the 2nd class of the III grade of Sultan breeding with a moisture content of 9.3% and contamination of 1.66% with a spiked drum on the feeder of a 90-saw gin at a distance of 16-18 mm. In this case, the degree of seed damage in the composition of cleaned cotton averaged 2.18-2.11%, and the quality of the seeds improved by an average of 0.09-0.14 (abs)% compared to the quality of the seeds in

the composition of cleaned cotton in the existing feeder-cleaner. The cleaning efficiency of the feeder during cotton cleaning averaged 21.7-18.7% with a change in intermediate distances from 16 mm to 18 mm. The existing mesh surface feeder selected for comparison showed an average increase in cleaning efficiency by 2.9-2.3 (abs)% (Fig. 3).

When

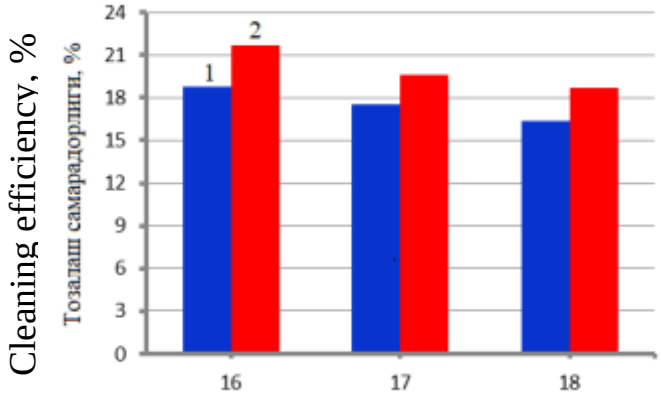

Figure 3.When cleaning Cotton of the Sultan select III class, the feeder pile depends on the intermediate distance of the separator from the drum, and the change in cleaning efficiency.
1-on the mesh surface, 2-on the windowsill with a colosnik

ginning cotton, the degree of seed fuzziness after ginning with a spiked drum and grate from 16 mm to 18 mm was practically the same, averaging 11.3%. In this case, the degree of seed damage averaged 3.31-3.12%, and the quality of the seeds improved by an average of 0.16-0.11 (abs)% compared to seeds produced from gin with a feeder with a mesh surface. The fiber contamination after ginning averaged 3.48-3.62%.), which is on average 0.12-0.15 (abs)% less than the fiber contamination produced from gin with an existing mesh surface feeder [5]. When ginning cotton, the gin's productivity averaged 863-916 kg/hour, which is 42-48 kg/hour higher than the gin's productivity with an existing feeder with a mesh surface.

When cleaning the fiber after ginning on a 5VP cleaner, the mass fraction of defective fiber and trash impurities in the fiber averaged 2.93% and 3.0%, and the quality of the fiber after ginning on a fiber cleaner with an existing mesh surface improved by an average of 0.21-0.19 (abs)% compared to the fiber produced and constituted grade III "Superior" class according to the state standard UzSst 604:2016.

As a result of the conducted research work, due to the improvement of the 90 saw gin feeder with a grate of a new design, an increase in cleaning efficiency and productivity of the gin, an improvement in the quality of the produced fiber and seeds, an effective cleaning and ginning process of low-grade cotton was carried out.

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