International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 4 Issue 5, July-August 2020 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Results Research on the Choice of Optimal Parameters of the Laser Saw

Sh. Imomkulov, X. Isaxanov, Z. Abdukahhorov

The Department of General Discipline, Kosonsoy Street, Namangan, Uzbekistan

ABSTRACT

Currently, there is no scientific justification for improving the geometric parameters of the laser saw and the accuracy standards of functional parameters. The issue of improving the geometric parameters of the saw is important and, in this regard, requires urgent resolution. The article deals with the issues related to the choice of optimal parameters of the laser saw.

KEYWORDS: *improvement of the working surface, saw, stability, strength, improvement, fibrous mass, quality indicators, blemish formation, omission, fibrous, finished product, wear resistance*

How to cite this paper: Sh. Imomkulov | X. Isaxanov | Z. Abdukahhorov "Results Research on the Choice of Optimal Parameters of the Laser Saw" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-5, August 2020, pp.1047-1051, URL: www.ijtsrd.com/papers/ijtsrd33069.pdf

IJTSRD33069

1. INTRODUCTION

No need to include literature survey as separate title. Introduction should represent the background of the recent advancements on the problem of your study and should convey how your study is warranted in the existing context. In other words,

The efficiency of Cotton processing machines is determined by the high-quality production of the most mass and responsible part of the working body-the saw blade. Taking into account the prevailing influence of the saw blade teeth on the quality of processed raw cotton products, it is necessary to ensure high-quality manufacturing of the disc in compliance with both the geometric parameters of the tooth and the roughness of its working surfaces [1].

2. Materials and Methods

In order to determine the optimal options for the profile of the teeth of the laser saw, laboratory tests were carried out. The optimal profile of the Genie saw tooth was determined, aimed at reducing its height. Then the teeth with such profiles were tested in gins and some results were obtained on reducing the amount of fiber defects and seed crushing.

When analyzing the results of ginning with the same tooth profile on laboratory and production gin, we found some changes.

For example, when ginning "VL-10", intense cottono selection occurred with a long tooth, and when testing saw blades with a height of 2 mm on the production gin, the opposite results were obtained, i.e., intense cottono selection occurred with a short tooth.

This contradiction is explained by the design features of laboratory and production gins, i.e. the first fiber removal occurs with a brush drum, and the second with a removable device. There is also a difference in power, speed, working bodies, and much more.

This was an objective reason that forced us to conduct further experiments only in production conditions - on active gins [2].

Further, on the basis of experiments conducted only on production gins, the questions of the influence of different tooth heights by the saw Genie on the technological properties and the nature of ginning are highlighted.

Experiments with some plants have shown that working with teeth with an increased thickness of the top of the tooth against GOST 1413-48 gave some improvement in product quality. In this regard, the first task was to determine the thickness of the tooth at the top, and then to determine the rational height of the tooth [3].

When determining the optimal thickness of the top of the saw tooth, the remaining parameters of the tooth remained in accordance with GOST 1413-48.

The main feature of our tests was to conduct them in production conditions [4].

Saw blades with a diameter of 312 mm with different thicknesses at the tops of the teeth were prepared in five versions of 100 saws each (Fig.1).

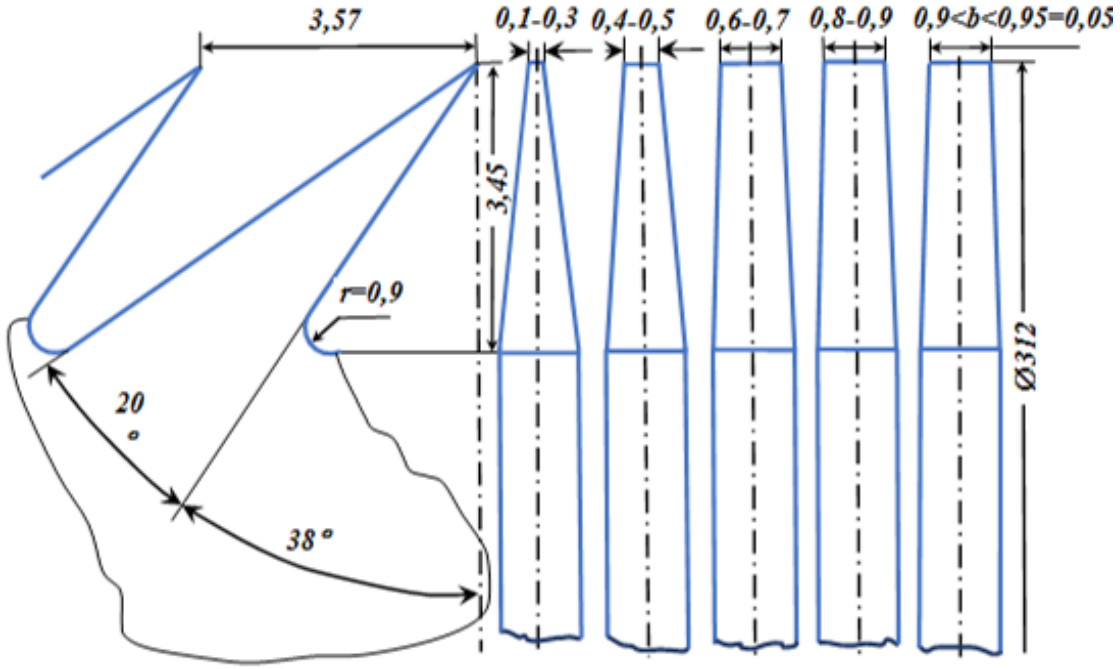


Fig 1 Diagrams of the tooth of a Genie saw with different thickness at the top

e-I variant-saw blades had teeth of thickness at the top = 0.2-0.3 mm, i.e. both sides of the tooth were chamfered on abrasives. Option II-when e= 0.4-0.5 mm, the chamfer is removed from both sides of the tooth.

Option III-when e= 0.6-0.7 mm, the chamfer is removed slightly from both sides of the tooth.

IV option-at e= 0,8-0,9 mm, only burrs were removed from the exit side of the punch

V option - at 0.95 > e > 0.9, i.e. the teeth after crossing were not processed for chamfering or Burr removal, only grinding was carried out in sand baths according to the existing operating instructions for the equipment of the saw shop.

The saw blades of the I-IV variants were also sanded under different conditions, in a sand bath according to the existing instructions.

The saw blades of each variant were separately mounted on specific shafts for a separate gin battery. Thus, each gin was completed with saws of a certain variant, after which all gins were adjusted the same way.

3. Results and Discussion

Tests were carried out under the same conditions and different modes of ginning. All gins worked mainly on the fourth power tooth, which corresponded to a performance of 9-10 kg of fiber per saw per hour. The pressure in the air chamber was maintained equal to 180-140 water column. The test duration for variants II, III and IV was 48 hours, and for variants I and V it was 4 hours. The reason for the short duration of the I and V variants was a noticeable deterioration in the quality of the fiber and seeds due to an increase in the density of the raw roller and poor removal of fiber from the teeth, especially in the V variant. In the II, III and IV variants, the ginning process proceeded normally and the fiber was also consumed normally.

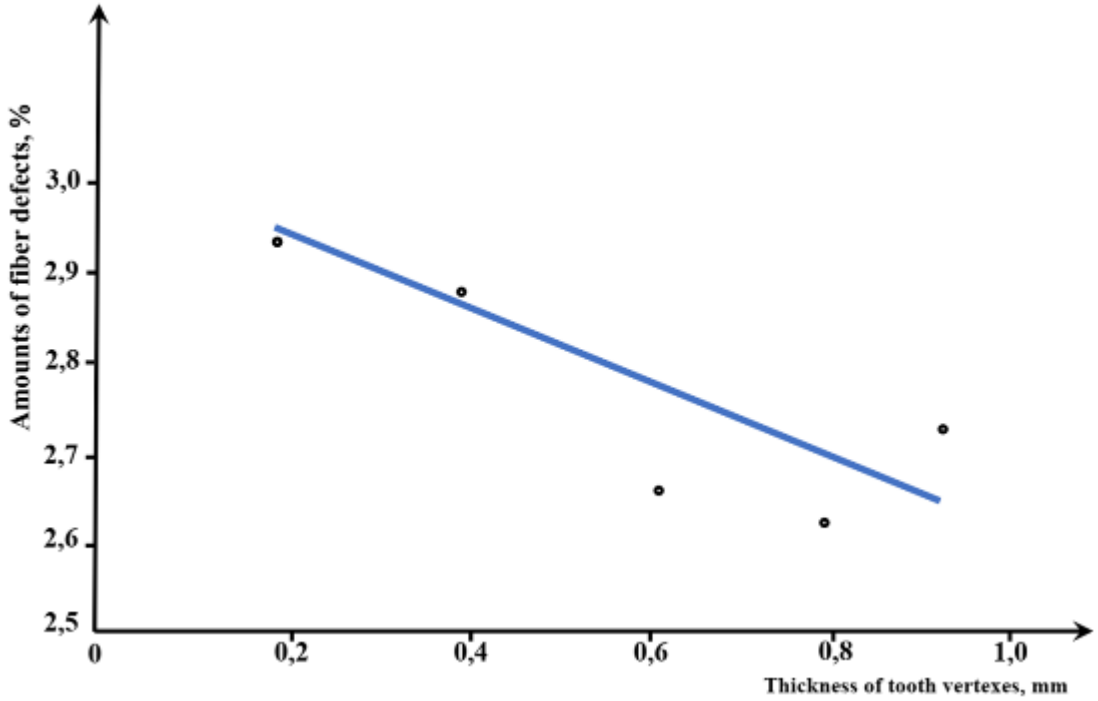
To assess the technological properties of fiber and seeds, the plant's laboratories took samples under our control and according to the developed methodology.

Fiber samples were taken from the neck of each gin for each variant, and seed samples were taken from the seed trays of each gin. The samples taken were taken three times per shift, i.e. for the II, III and IV variants 18 times, and for the I and V-3 times.

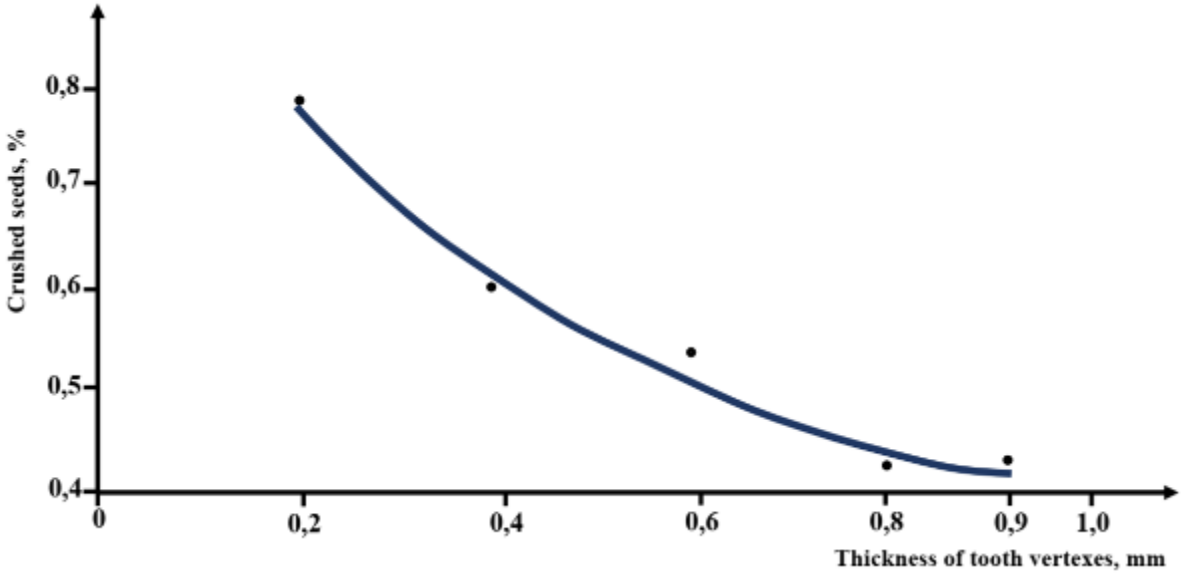
Technological analyses were carried out in the laboratory of the plant according to the existing rules.

At the time of sampling, the current strength in the phases of the electric motor of the gin saw cylinder was also measured.

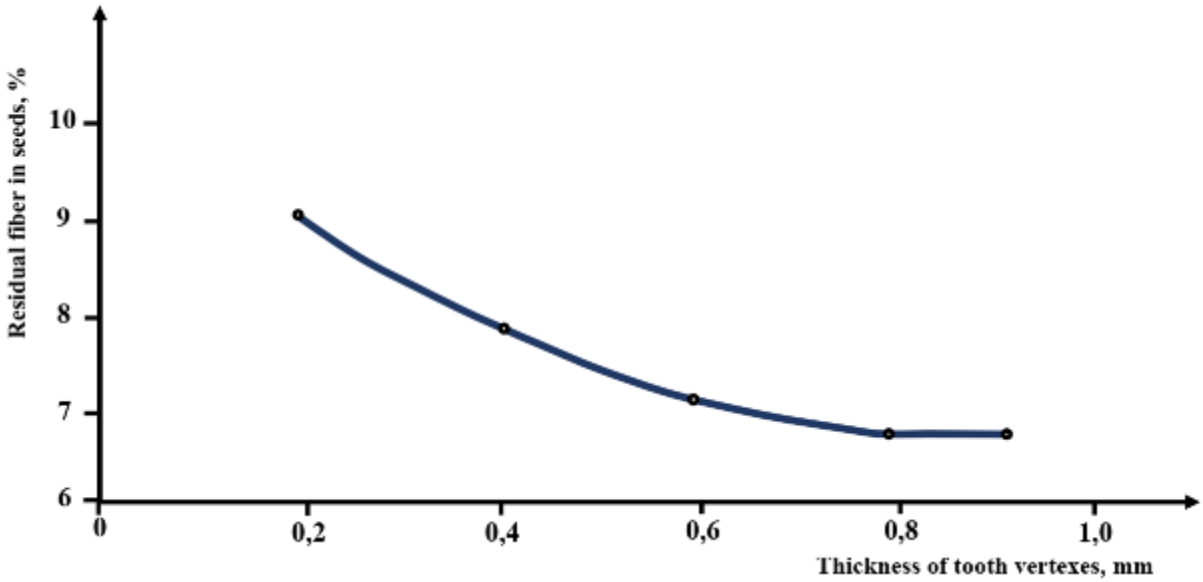
For clarity, the results are presented as graphs 1-5.



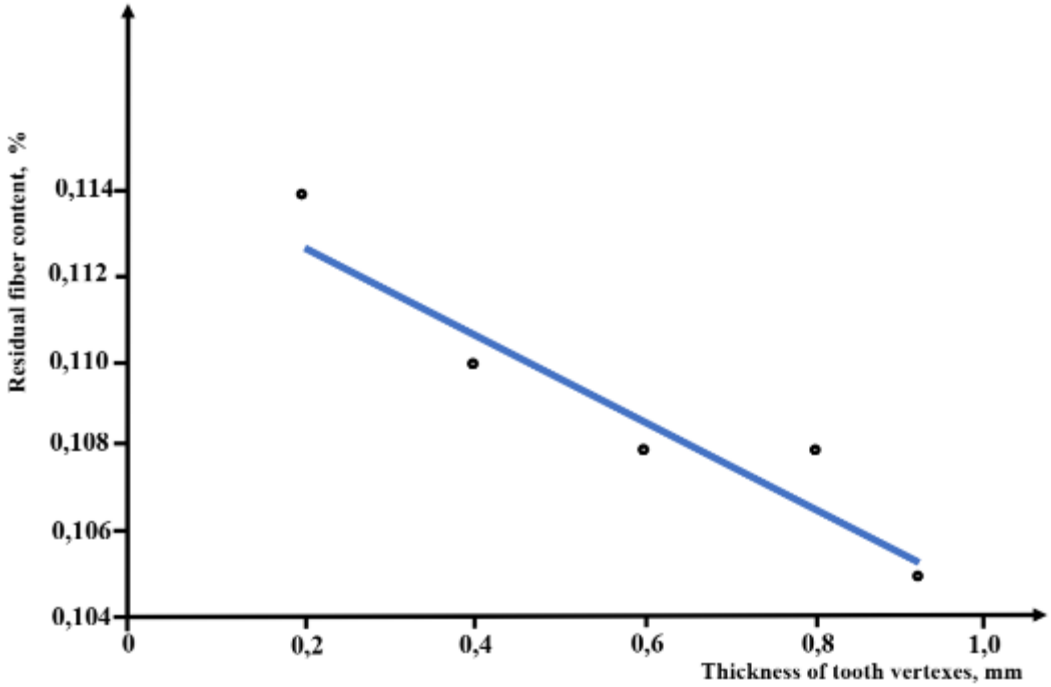
1 graph Depending on the amount of fiber defects on the thickness of the tops of the teeth



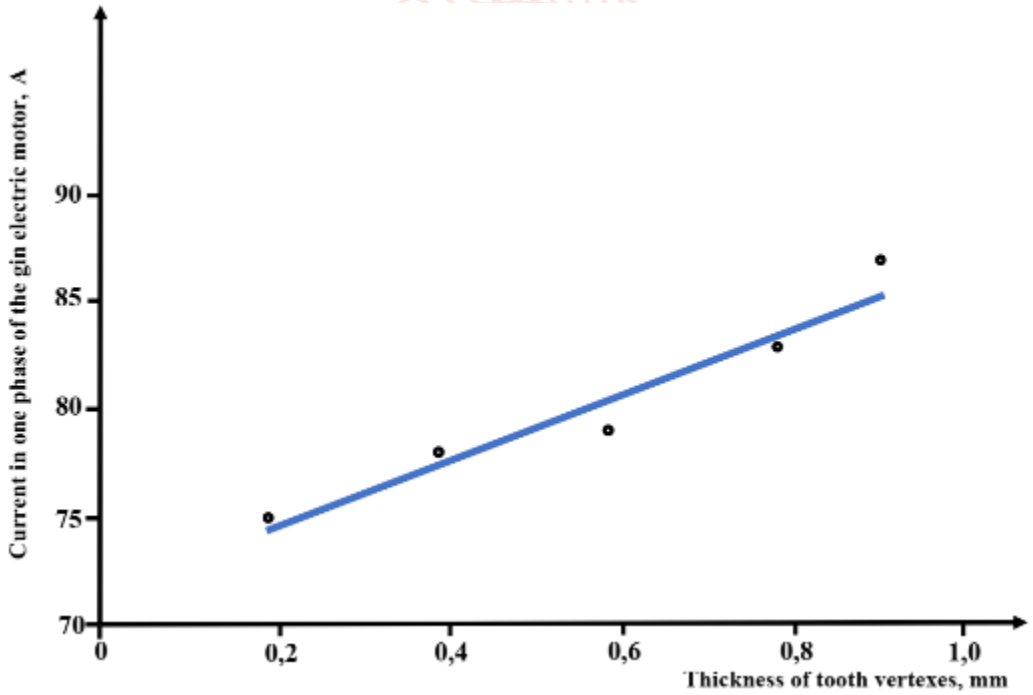
2 graph Dependences of the seed crushing on the thickness of the tooth tops



3 graph The dependence of the omission of the seed on the thickness of the tops of the teeth



4 graph The dependence of the residual fibrous content of the seed on the thickness of the tops of the teeth



5 graph The dependence of the current strength of one phase of the gin motor on the thickness of the tops of the teeth

Graph 1 shows that as the thickness of the tooth vertexes increases, the number of defects in the fiber decreases, which is mainly due to a decrease in the broken seed in the fiber. At the same time the content of litter and cotton in the fiber almost does not change

The explanation that the increase in thickness at the top of the tooth causes a decrease in the amount of defects in the fiber, apparently, is that the specific pressure of the edge of the tooth on the fiber and seeds decreases and this was accompanied by a decrease in the damage of the latter. In contrast to the General pattern, the amount of fiber defects on the V version of the saw had an inflated value.

This can be explained by the fact that the saw blades of the V variant did not undergo chamfering after the tooth was re-cut; only the teeth were ground in a sand bath under different conditions with other options for preparing the saws [5]. Apparently, such an identical condition for processing the teeth for all variants is not sufficient for the V variant, and the teeth of the V variant are obviously not free from invisible burrs. Thus, the number of burrs on the teeth of the V variant was greater than on the teeth of the I and IV variants. And in the industry, it has long been known that the presence of burrs leads to a deterioration in the quality of products [6].

Graph 2 shows that the change in the crushed seed occurs inversely proportional to the change in thickness at the tops of the tooth. The reasons for this are also found in the change in the specific pressure on the seeds from the edge of the tooth.

From graph 3, it can be seen that the change in the full omitted seed occurs in the opposite proportion to the change in the thickness of the tooth vertexes.

4. Conclusion

Researchers Levkovich B. A., Rakhimov N. M. found that an increase in the thickness at the top of the tooth causes an intensification of the intervene process [7].

It is possible that in the process of ginning occur and processes partial intervene. If we assume this, then in our case, the increase in thickness at the top of the tooth also caused an intensification of the linting process during ginning. Therefore, an increase in the thickness at the top of the tooth caused a decrease in the full pubescence of the seeds.

Graph 4 shows that the residual fiber content of the seed's changes in inverse proportion to the change in the thickness of the tooth apex. The explanation for this is the same as in figure 3.

Finally, graph 5 shows that the law of changing the load on the motor of the gin saw cylinder relative to the change in tooth thickness proceeds according to the law of direct proportion [8].

The explanation of the latter is that when the thickness at the top of the tooth increases, the degree of its contact with the mass of the raw roller increases and this causes an increase in the load on the gin shaft.
Thus, according to the results of the test, we come to the conclusion that the rational thickness at the top of the saw tooth is equal to e=0.8±0.1 mm, at which it is possible to obtain products of the proper quality.

5. References

[1] Fedorov V. S. Technology of primary processing of raw cotton, Gilegprom. 1937

[2] Levkovich B. A. Elements of the ginning theory. The state publishing house Uz SSR. Tashkent, 1938

[3] Saidov, Kh. On the rational profile of the Genie saw tooth, New technology Magazine. GITH UzSSR by co-Ordin. n / a works no. 3. 1962 Pages 22-24.

[4] Levkovich B. A. Rational profile of the tooth of a fiber-separating saw. Collection of TTI, no. 12, 1961

[5] Akhmedova S. About the tooth profile of a fiber-separating and fluff-separating saw. Collection of TTI, No. 6, 1958

[6] khamov M. G. Grinding the teeth of saw sections with powdered abrasive material in a sand bath / / Ref. SB. Cotton industry. - Tashkent, 1991. - No. 5.- 14-16 p.

[7] Sh. Imomqulov, Z. Abduqahhorov, "Influence to Optimization Geometric Parameter Saws on His (Its) Capacity to Work". International Journal of Recent Technology and Engineering (IJRTE). Volume-9 Issue-1, May 2020. 1749-1753 p.

[8] Sh. Imomqulov, Z. Abduqahhorov, "Improvement Geometric Parameter Saws And Increasing His(Its) Capacity To Work" International Journal of Engineering and Technology (IJET). Vol 12 No 3 May-Jun 2020. 503-507 p.