



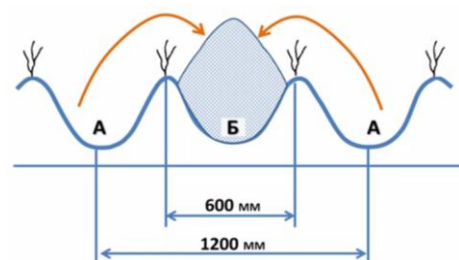
The Parameters Basis of the Protective Sheller of the Longitudinal Pawl Making Device Between Cotton Rows

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ABSTRACT The article describes the results of research on the parameters of the sheath that protects the longitudinal pawl formation device between cotton rows from burying cotton seedlings in the soil pile.

Keywords: Cotton, Longitudinal Pawl, Aggregate, Frame, Rolling Surface Working Body, Protective Sheath, Grinding-Compacting Ski.

The main issue in creating a longitudinal pawl between cotton rows is to remove soil from the edges on both sides (A) of the middle row where the pawl is to be formed and align it to the middle (B) row without damaging the cotton seedlings (Figure 1). Longitudinal pawl between rows of cotton is formed before the first irrigation of cotton and is used until the end of the growing season. Therefore, it is necessary to carry out this technological process through pawl-forming devices that meet the established agro-technical requirements.



A - soil removable side edges
B- the area where the soil is compacted and the pawl is formed

Figure 1. The process of forming a longitudinal pawl between the rows of cotton

Based on the above, a device consisting of overturning working bodies that form a

longitudinal pawl between the rows of cotton was developed (Fig. 2). Frame 2 equipped with a tie device 1 and the right 3 and left 4 overturning working bodies and cotton sheets 5) and polishing-compacting skis on both sides of the pawl, which protect the cotton seedlings from being buried by a pile of soil thrown from the overturning surface 6 composed of [1,4].

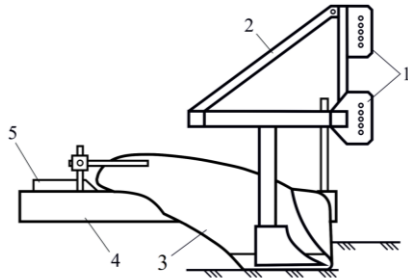


Figure 2 The general scheme of the device of forming a longitudinal pawl between the rows of cotton.

1-tie device, 2-frame, 3-roll surface body, 5-protective sheath, 6-grinding-compacting skis.

The main requirement for longitudinal pawl forming devices between cotton rows is to carry out the technological process without damaging the cotton seedlings. This paper presents the results of research to determine the parameters of the longitudinal pawl forming device between the rows of cotton, which protects the cotton seedlings from being buried by a pile of soil thrown from overturning surfaces. In the studies, the height of the protective sheath of the device and the values of the bending radius R_g were determined on the condition that the cotton seedlings were not damaged.

The main indicators in determining the parameters of the protective sheath of the device are the height and width of cotton seedlings during the period of formation of the pawl. Therefore, experiments were conducted to determine the growth status of cotton seedlings. In the experiments, the condition of cotton seedlings was measured at 10 repetitions using the scheme shown in Figure 3 on the diagonal of the field, and average values were determined [2]. The data studied on the experimental field were compared with other

fields and it was found that the difference between the results was around $\pm 5\%$.

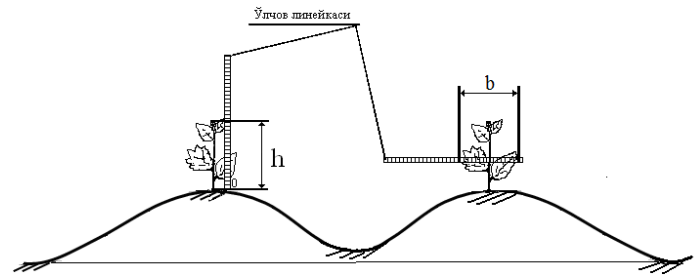


Figure 3. Scheme for measuring the height and width of cotton seedlings

The analysis of the research shows that the average length of cotton seedlings was 12.4 sm and the average width was 9.3 sm during the period of dividing the area between the third cultivation and the first irrigation process, depending on the soil conditions. identified [3].

Based on the above, we determine the height and radius of curvature of the sheath, which prevents the cotton seedlings from being buried by the soil falling from the surface of the overturning, provided that the cotton seedlings are not damaged by the following expressions:

$$h_z \geq H_{H\check{y}} + 3\sigma_{\check{\sigma}} + d_T \tag{1}$$

and

$$R_z \geq 0,5K_{H\check{y}} + 3\sigma_{\check{\sigma}} + d_{\check{e}}, \tag{2}$$

Here $H_{H\check{y}}$, $K_{H\check{y}}$ - height (length) and width of cotton seedlings during threshold formation, respectively, m;

$\sigma_{\check{\sigma}}$, $\sigma_{\check{\sigma}}$ - the standard deviation of the height and width of cotton seedlings, respectively, m;

d_T , $d_{\check{e}}$ - the amplitude of the vertical and lateral oscillations of the device due to irregularities between the rows of cotton, respectively, m.

Assuming that $H_{H\check{y}}=12,4$ sm, $K_{H\check{y}}=9,3$ sm, $\sigma_{\check{\sigma}}=\pm 1,4$ sm, $\sigma_{\check{\sigma}}=\pm 1,1$ sm and $d_T=3$ sm and $d_{\check{e}}=2$ sm, (1) and (2) in terms of 19.6 sm and 10 sm.

In conclusion, studies have shown that the height of the protective sheath of the longitudinal pawl forming device between the rows of cotton should be 19.6 sm and a radius of curvature of 10 sm.

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