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АНАЛИЗ ИЗМЕНЕНИЯ РАЗМЕРОВ СФОРМИРОВАННЫХ ОСЕНЬЮ ГРЕБНЕЙ, ПЕРЕД ВЕСЕННИМ ПОСЕВОМ СЕМЯН ХЛОПЧАТНИКА

ANALYSIS OF CHANGES IN THE SIZES OF RIDGES FORMED IN AUTUMN BEFORE SPRING SOWING COTTON SEEDS

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В данной статье приведены сведения о результатах анализа изменения размеров сформированных осенью гребней, перед весенним посевом семян хлопчатника.

This article provides information on the results of an analysis of changes in the size of ridges formed in the fall, before the spring sowing of cotton seeds.

Ключевые слова: *гребень, посев на гребень, угол естественного уклона, влажность почвы, высота гребня, семена хлопка, естественное оседание гребня, радиус кривизны, угол трения, защитные пластины.*

Keywords*: ridge, seeding on ridge, natural slope angle, soil moisture, ridge height, cotton seed, natural ridge settlement, radius of curvature, friction angle, protection plates.*

INTRODUCTION
In many regions of our republic, the main purpose of planting seeds on the ridge is to protect the seeds from rotting due to spring rains, to protect the soil from excess cuttings and to water them [1]. As a result of scientific research carried out by scientists, it was found that the yield increases by 3–4 t/ha when using the technology of planting seeds on the ridges [2]. There are two types of technology for sowing seeds in the field: making the ridges in the fall and planting the seed in it in early spring, and making the ridges in the early spring and planting the

seed in it. The advantage of planting the seed on the ridges is that its temperature is 3–4 C higher compared to the flat area, it retains the moisture in the soil well, and after planting, the costs of soil treatment are less [3].

MAIN PART

As is known, during the operation of hillers of agricultural machines, ridges are formed, the walls of which crumble at an angle β of natural repose. At the same time, the angle of natural repose of gray earth soils prepared for sowing when poured with an increase in soil moisture from 7 to 18 % increases from β = 32°–41°.

The main parameters of the ridges prepared for seed planting include the width of the lower base B_p, the width of the leveled surface for planting crops in the upper part b_{yu}, the angle of inclination of the side surfaces of the seedbed to the horizontal plane β, and the height of the ridge H (fig. 1).
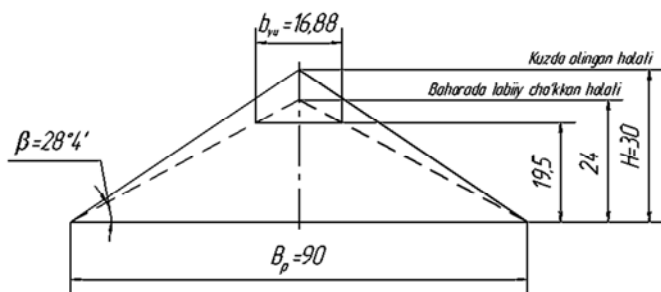

Figure 1 – Basic parameters of the ridge

In our republic, the seed is mainly planted in schemes with 90 cm, 60 cm and 76 cm between rows [4]. If ridges are prepared in autumn in a 90 cm scheme, its height will be $H = 26…28$ cm. In the spring, the height of the ridge naturally decreases until the sowing period [1]. The reason is that due to the autumn and winter precipitation, the porosity of the ridges is pressed and the density of the ridge partially increases.

From the conducted studies, it was determined that the coefficient for taking into account the natural subsidence of the ridge height is equal to $K_y = 0,85 - 0,90$ [1]. If the height of the ridge of 90 cm taken in au-

tumn is equal to $H = 26...28$ cm, it was found in the experiments that the height of the ridge will be $H = 19…21$ sm by spring due to natural subsidence (fig. 2) [1].

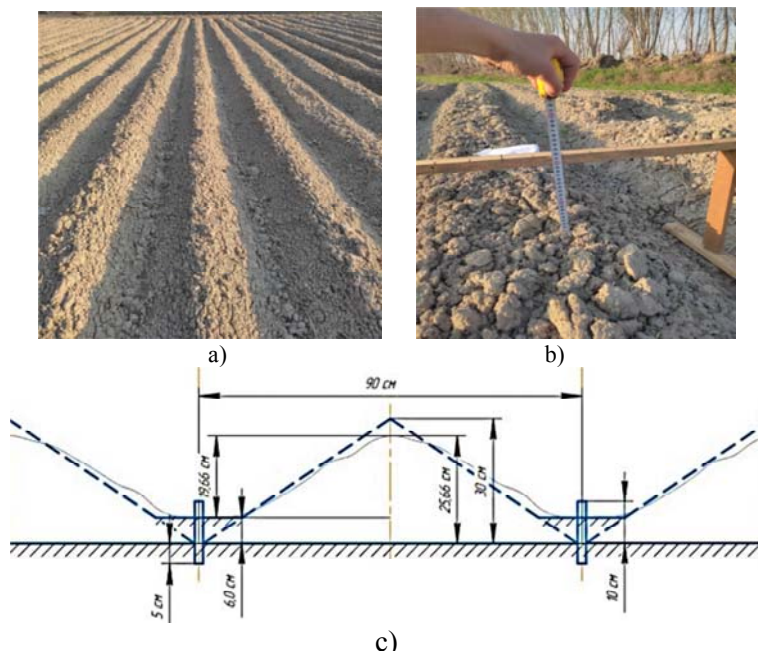
a)   b)

c)

Figure 2 – Measurement of the height of the ridge taken in autumn in the natural subsidence state in early spring:
a – 90 scheme ridge taken in autumn, *b* – measuring the height of the ridge in the natural subsidence state in early spring, *c* – the scheme for determining the height of the natural subsidence ridge

The slope angle β of the side protection plates of the ridge relative to the horizontal plane can change depending on the density of the ridge. If the angle of inclination of the ridge taken in the 90 cm scheme in autumn is equal to β = 32–41° [1], it was observed in the experiments that this angle of slope before planting by spring is β = 25–30° (fig. 3).

These above-defined parameters serve as the basis for the development of the design of the working body of the sectional seed drill that maintains the ridge shape
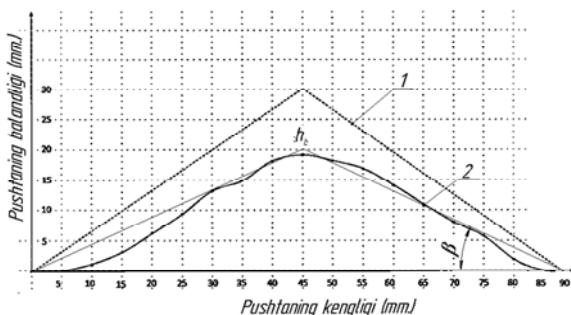
Figure 3 – The angle of inclination of the naturally sunken ridge
to the horizontal plane before seeding β:
1 – ridge taken in autumn; *2* – profile of naturally sunken ridge in spring

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