



**DETERMINATION OF SPRAY TIP PARAMETER OF COMBINED  
SUSPENSION SPRAYING EQUIPMENT RELATIVE TO COTTON BODY  
WHEN PROVIDING BETWEEN ROW OF COTTON**

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**Annotation**

This article is aimed at the effective use of modern technology and technical tools in the fight against various diseases and pests of plants in the cultivated fields of our republic, improving the processes of increasing the quality of processing.

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This article is devoted to the effective use of modern technologies and technical means in the fight against diseases and pests of agricultural crops in the country, and improving the quality of processing.

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**Keywords:** chemical working mixture; cotton; suspension; fan devices; agrochemical processing; combined sprayers.

The development of the cotton plant, which is one of the agricultural crops, depends on various factors, and it is related to the timely application of chemical agents (pesticides) and suspensions to the cotton to fight against diseases and pests.

In the process of chemical treatment of plants, the use of ventilator devices causes strong poisoning of the environment and air.

According to the current sanitary rules, the use of fan sprinklers is allowed at least 500 meters away from residential areas and recreation areas. Such a modern demand for plant treatment places important tasks on scientists to create high-efficiency, minimal air pollution and energy-efficient technology for perfect agrochemical treatment of cultivated fields.





When using imperfect agricultural techniques, the use of agrochemicals in the process of processing causes an increase in the consumption of working compounds and worsens the ecological composition of the environment, increases energy consumption, and reduces economic efficiency.

In order to eliminate the above shortcomings, it is necessary to introduce chemical treatment techniques and combined techniques to the production of plants. In this case, it is effective to use mini-sprayers that spray the chemical mixture directly on the upper and lower sides of the cotton leaves, not in the air.

Because when such devices are used, the environmental damage of chemical compounds is reduced from 500 meters to 200 meters. The reduction of the range of distribution of the chemical mixture into the environment during chemical processing allows processing of cultivated fields in places close to residential areas.

By using combined sprayers, the consumption of chemical working fluid spread to the soil and atmosphere and the damage to the environment, the negative impact on human health will be reduced to the maximum.

It can be said that the parameters of the spraying triplets depend on the consumption of the working liquid of the combined sprayer during cotton inter-row processing.

Adjustment of sprayer triplets to a certain working order is carried out according to the consumption of the suspension sprayed on the cotton leaf, taking into account the speed of movement of the sprayer and the coverage width. Taking into account the above parameters, the three-way transmission consumption ( $m^3/c$ ) is determined by the following formula.

$$q = 10^{-6} \frac{QBv}{n}; \quad (1)$$

Here Q- the prescribed standard consumption of the working fluid, l/ha; B- coverage width of aggregate, m;  $v$ - unit speed, m/s; n is the number of triplets. According to the formula (1), the consumption of the liquid sprayed through the nozzles, the spraying surface of the liquid sprayed from the nozzle is  $f$  ( $mm^2$ ), the pressure of the working liquid in the reservoir is P (MPa), and the following expression can be obtained.

$$q = 0.01\mu f \sqrt{2gP}; \quad (2)$$

Here,  $\mu$  is the consumption coefficient depending on the type of triple, for centrifugal triples with a core,  $\mu=0.41$ ;  $\mu=0.27$  for conic and tangential centrifugal threes.

Taking into account that  $f=pd^2/4$ , the pressure P, the cross-sectional surface of the exit hole of the triple, for which certain conditions are required, shows the dependence of the working pressure P on the trunk and the speed of movement of the unit, i.e.





$$Q = 10^{-6} \mu z f \sqrt{\frac{2gP}{\nu B}} ; (3)$$

The plane of covering the upper and lower parts of the cotton leaves when treated with a chemical working mixture depends on the height on the surface of the combined suspension spraying device.

According to agrotechnical requirements, the height H of the combined suspension sprinkler should be selected in such a way that the surface of the liquid sprayed from the spray cones should cover each other, which ensures the treatment of the leaves both from the top and bottom and the amount of liquid consumption is uniform over the coverage width.

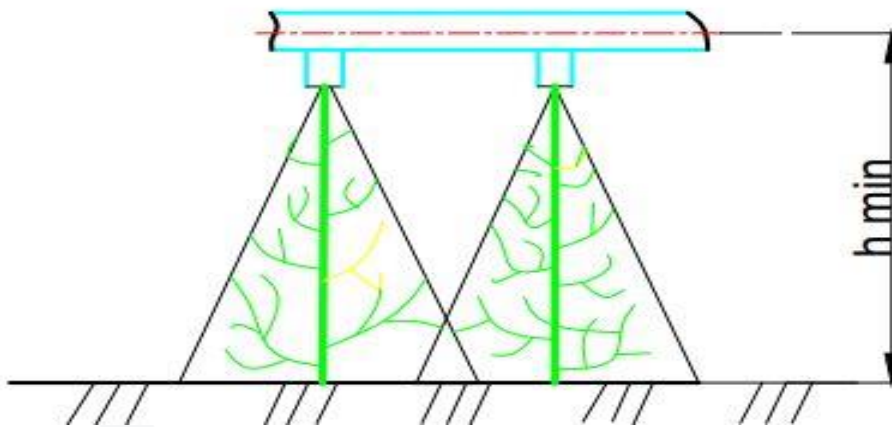


Figure 1. Scheme for determining the installation height of the combined suspension sprinkler on the KXU-4 cultivator.

The minimum installation height of the suspension sprinkler is determined by the formula in the sheep

$$h_{\min} = \frac{\ell}{\operatorname{tg}\left(\frac{\alpha}{2}\right)} ; \quad (4)$$

Here  $\ell = \frac{B}{n}$  - distance between triplets, m; coverage width of the V-sprinkler device, m; n- number of triplets and  $\alpha$  - spraying angle. The optimal placement height of the suspension and chemical working mixtures is represented by the formula

$$20h = h_{\min} \leq h \leq h_{\max} = 90h ; \quad (5)$$



It can be concluded that, as a result of scientific research and experimentation, the optimal placement height of the combined suspension and chemical mixing device installed on the KXU-4 cultivator satisfies the expression (5).

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