

Investigation of Operating Operations of Chemical Treaters for Vineyards and Orchards

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Annotation. This article describes the structure, parameters, operating modes, design schemes, areas of application, its operating modes at different speeds, and recommendations for the chemical spraying of vineyards and orchards.

Keywords. sprayer, centrifugal fan, fan, that ripple, chemical protection, universal hanging sprayer.

Introduction:

Chemical treatment of orchards and vineyards is universal and is widely used around the world due to its ability to treat vineyards and trees on a large scale. In the protection of gardens, it is desirable to use a combination of chemical methods with other harmless and effective methods. Agrotechnical requirements. If pesticides and diseased trees are treated promptly with toxic chemicals, their effectiveness will be as expected. The number of chemicals in the solution, suspension, and emulsion may differ by $\pm 5\%$ from that prescribed. In the process of chemical treatment of orchards, the machines perform the following three operations: dosing the toxic substance, breaking it into fine particles, and transferring the resulting particles to the processing facility. When machined with such a machine, the special liquid in a special tank is pumped to the decomposing triple under the required pressure. The triads break up the solution into particles and transfer them to the treated plant by giving them kinetic energy (or by using a strong air stream). Any spray tank, pump, or disintegrator consists of three.

Method and materials

In chemical sprayers, the fan is used for two purposes:

1. To break up the working fluid or powdery substance into fine particles or to additionally grind large particles that the trinity has broken down.

2. To transfer the decomposed chemical from the trinity to the processing facility. [1]

In order to break down the chemical into fine particles, the velocity at which the air flow generated by the fan exits must be large. In order to transfer the broken droplets to a distant object, the pressure of the air flow in the nozzle must be large and the work efficiency must be sufficient. Chemical protection machines mainly use fans that suck from the center or across (along the axis of rotation). According to the description of such ventilators, the velocity at the mouth of the centrifugal fan is greater than the velocity at the suction fan along its axis, i.e. it breaks down the liquid relatively more strongly. However, in terms of the ability to transmit fragmented droplets, the fan along the opposite axis is predominant, as the pressure in its flow does not decrease significantly from a distance of 4 m to 14 m. The flow rate generated by the centrifugal fan decreases sharply at a distance of 4 m (from 85 to 10 m / s, i.e. 8 times), and in the axial fan decreases from 45 to 25 m / s, i.e. by 1.8 times. Therefore, along the axis, the fan dissipates the fluid more slowly but can transport it farther away.

The two side air outlet windows of the universal hanging spray fan housing are fitted with working parts for processing orchards and fruit orchards. These working parts are chemically treated in gardens (vineyards, apples, pomegranates, figs, etc.) planted in rows up to 3 m in height.

Conclusion and discussion

The parameters of the spraying bodies include: - diameter of the fan wheel, m ; - diameter of the air inlet window to the wheel, m ; and - the width of the air inlets and outlets of the shovels mounted on the wheels, respectively, m ; - length of the shovel, m ; and - pitch and number of shovels, respectively; n is the number of revolutions of the wheel; and - the width of the casing and the diameter of the air inlet, respectively, m ; - a gap between the edge of the exit window and the wheel; and - the size and number of raspilitel liquid outlet holes, respectively.

Theoretical studies were conducted to substantiate the optimal values of the above parameters of the sprayer. Based on the analysis of previous research on the theoretical determination of the parameters of centrifugal fans, the following conclusions can be made:

- Insufficient research work on the theoretical determination of the parameters of centrifugal fans in the country;
- Extensive research has been conducted on centrifugal fans in Russia and abroad, and methods for determining their parameters have been developed.

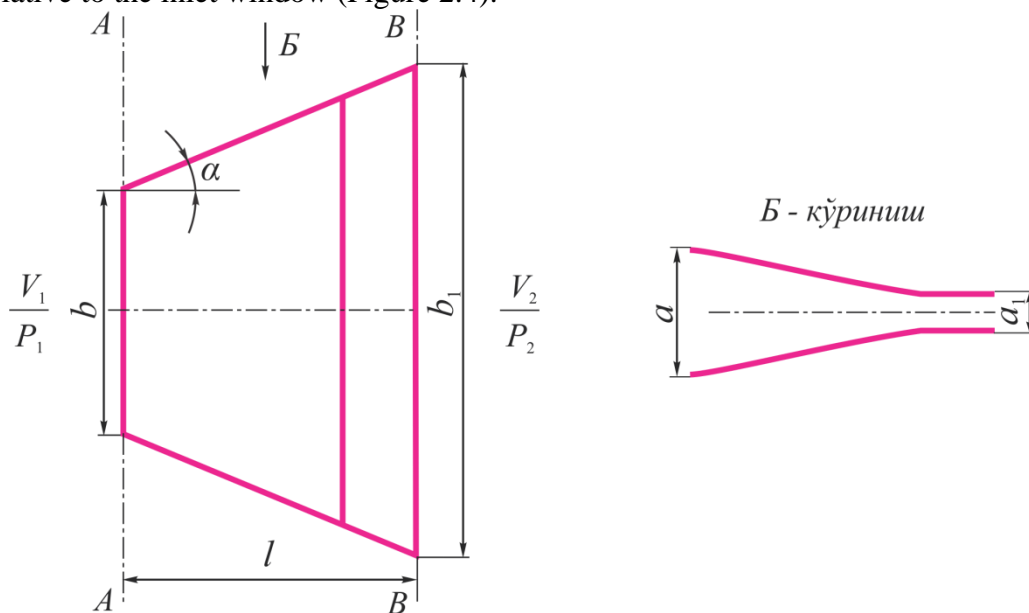
However, these methods are not general, i.e. they cannot be used for centrifugal fans, which are used in all areas.

An analysis of the methods for theoretically determining the parameters of centrifugal fans showed that the parameters of fans used in different fields are not defined by clearly and strictly mathematically related expressions, they are based on approximate, empirical, and semi-empirical expressions [2; 14-b.]. The aerodynamic properties and technological operation of centrifugal fans mounted on sprayers are very different from fans used in other fields, and no method of theoretical determination of their parameters has been developed.

Based on the above, it can be noted that the development of a method for the theoretical determination of the parameters of centrifugal fans mounted on sprayers used in agriculture is one of the most pressing issues today.

The aerodynamic performance of the airflow from the working parts mounted on the centrifugal fan housing has a direct impact on the quality of the working fluid spray. Therefore, it is necessary to determine the pressure of the airflow generated by the fan at the outlet of the working part of the sprayer and its lost part, speed, and efficiency.

The inlet and outlet windows of the workpieces are rectangular in shape and the shape of the outlet window is modified relative to the inlet window (Figure 2.4).



A-A working part entrance window; V-V is the exit window of the working part

Figure 2.4. Schematic of the universal hanging sprayer working part

The surface of the exit window is the surface of the entrance window

The distance between them is made relatively small ga teng. [3].

In this case, the air flow generated by the fan spreads from the exit window of the working part and provides extensive treatment of trees up to 3.0-3.5 meters in height. Similarly, the working parts are mounted and machined on the sprayer based on the dimensions of the replaceable and machined joints.

Conclusion

We study the aerodynamic state of the air flow generated by the spray fan at the inlet and outlet windows of the working part. In this case, the air flow enters through the exit window of the casing into the entrance window of the working part, moves through it and goes from its exit window to the open atmosphere. In this case, the surfaces of the exit window of the fan housing and the entrance window of the working part are evenly prepared.

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