Composition of the drive aggregate in relation to the dimensions of the treated area

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A K Igamberdiyev, S Alikulov, N B Razikov, E U Usmanov, O E Usarov

Tashkent Institute of irrigation and agricultural mechanization engineers, Tashkent city, Qori Niyaziy street, 39

E-mail: razikov1102@bk.ru

Abstract. The article presents the analysis of various ways to optimize the operating modes of machine-tractor units, studied the work of other authors on the effective use of machine-tractor units equipped with powerful engines, on the use of intelligent on-board computers. The effective use of each agricultural unit treatment of the shape and size of the field by taking into account the content of the units so that we need to choose it, it's the technical efficiency to be high , it is necessary to achieve. According to the results obtained, the highest technical efficiency is achieved when plowing the field with this aggregate, since the relative coefficient of the field sides is equal to the smallest amount (S1=0,52) when the coverage width of the aggregate is 1 m when processing the area is F=5 and the field with the length L = 300 m.

1. Introduction

The factors contributing to the increase in the efficiency of use of agricultural units are also given. It is theoretically justified that the coefficient A, which takes into account the working and idle speeds of the unit, depends on the operator's qualification, equating the idle speed to the worker's speed provides a high degree of efficiency, the increase in the working strokes depends on the coefficient, taking into account the width and length of the field, the decrease of this coefficient (B≤1) contributes to increased operational efficiency [1-3]. In small areas, as compared with large ones, the operational size and efficiency of the unit increases, the idling length depends on the kinematic length and turning radius, and the operation of units composed of combinational and trailed agricultural machines reduces the efficiency of their use [4-7]. The unit composed of mounted, highly mobile agricultural machines, therefore in combines, increases the efficiency of their use [8-12].

The recommendations are given for solving the issues of increasing the efficiency of use of agricultural units equipped with modern agricultural machines on the need to substantiate the optimal size of fields for the effective functioning of agricultural units [13, 14]. The conclusions and proposals for improving operational efficiency, as well as factors affecting the operational efficiency of an agricultural unit, such as the size of areas and modes of operation of the units, are presented. Rural management in the field of modern driving units in use, most primarily, their use of the indicators of the improvement at the expense of the work of raising modern methods to identify and fulfilled the work of the organization of the new order and the rule of work to be introduced that has been noted [15].

Type of crop and care technology [16], configuration of the sown area (square, trapezoidal and complex shape), surface (size) [17], length and width of rotation [18], turning area [19, 20], creation of

a mathematical algorithm for choosing the parameters of the kinematics and operating mode of the unit. Machine-tractor unit, taking into account the dimensions of the width, traction resistance and the mode of movement of agricultural machinery per square meter; - Improving the accuracy of the parameters of state technical policy by calculating the optimal fleet of machinery and tractors for growing crops, creating conditions for implementation by each specific cluster, farm and dekhkan economy, as well as landowners who are not part of the traditional method [21, 22].

Irrigation farming in the context of different sizes and the shape of the field driving units work' s increase and its dramatically change the effectiveness of the technical leads [23]. Therefore, the effective use of each agricultural unit treatment of the shape and size of the field by taking into account the content of the units so that we need to choose it, it's the technical efficiency to be high , it is necessary to achieve.

2. Materials and methods

In natural conditions, having the same surface area the size of the field, the ratio of the width and its height can be varied.

In the meantime, the area of crops that are currently available and the farm is located and shape of the surface of the natural relief of the region from the beginning of taking the specific features of the method of watering crops grown was established if both of them change in general not possible (Figure 1).

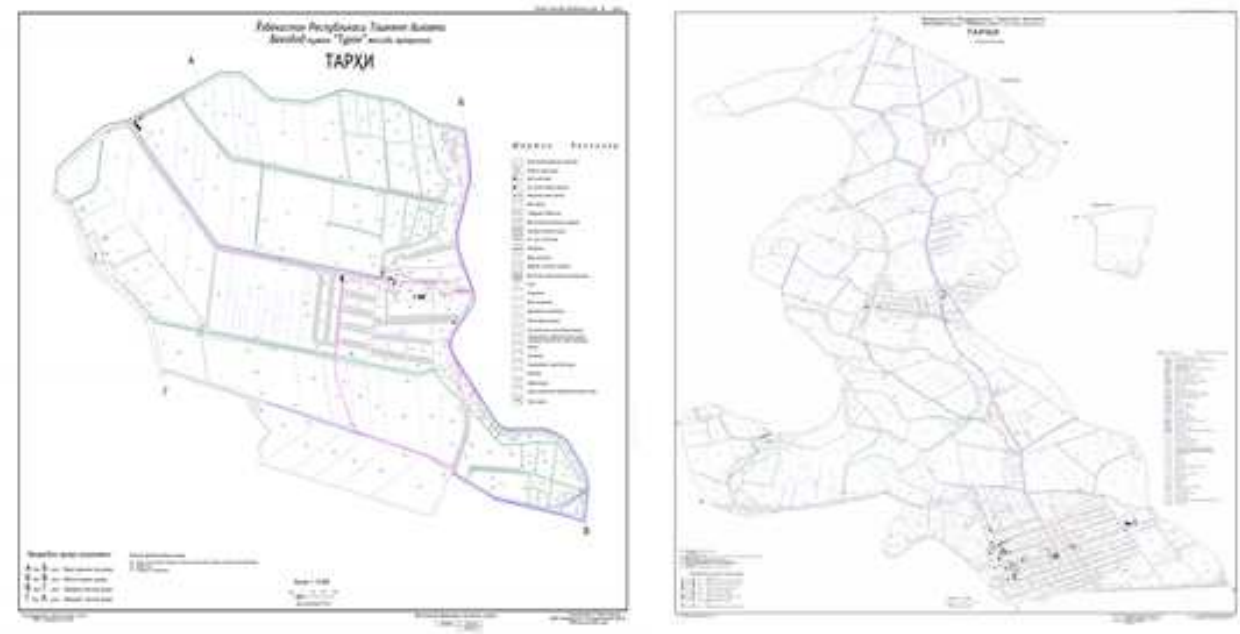

Figure 1. Location of crop fields in the District neighborhood civil gatherings

Therefore in increasing the technical efficiency of driving units tothe size of the land area available agronomic and fulfilled the specific characteristics of the work taking its acceptable to choose to use ingredients that can give high results.

As it is known, the edge of the field most of the units increasing the level of effective use of the basic indicator. Because the width of the field edge how is taller than if the unitsing salt field at the end of the turn, the number of members increase,its effective work of the time will lead to a drastic reduction.

For irrigated farming conditions, the length of newly opened land plots should not exceed 400-500 meters. If the edge of the field because of how long the irrigation worksof the durationto be stretchedand his quality will lead to dramatically decline [24, 25].

It is known that the most optimal form of the crop area is a square, and its distinctive feature is that, firstly, the number of work and salt walks of the aggregate moving in the field is equal to each other, and secondly, in this view, the aggregate can move along the length of the field or across the feed, depending on the conditions .This conditionto following inequality expression with thiscan:

$$\mathbf{1} \leq \frac{\boldsymbol{V_d}}{\boldsymbol{L_d}} \leq \mathbf{1}$$

Where: L_d–the edge of the field, m; V_d – the width of the field, m.

The physical meaning of this inequality is that the ratio of the area of the earth to the width of the face indicates that the smaller the unit, the higher their technical efficiency when using large-coverage aggregates, on the contrary, the larger the ratio, the smaller the coverage aggregates.

The technical efficiency of the aggregate is determined as follows: the height of the land area and its width (L_g and 〖 V〗 _(D)), The salt and the working walking lengths of the aggregate (L_(c) val_i) as well as the speeds (〖V_c and V〗 _I), as well as the width (E) of the turning path relative to the coverage

$$\boldsymbol{TS}=\frac{\mathbf{1}}{\mathbf{1}+\frac{\boldsymbol{V_I V_d}}{\boldsymbol{V_s L_d}}\left(\frac{\boldsymbol{L_c(V_d+2-V_m)}}{\boldsymbol{V_d^2}}\right)}\mathbf{100\%}$$

A $\frac{V_I}{V_s} = A, \frac{B_d}{L_d} = S, \left(\frac{L_c(V_d+2-V_m)}{V_d^2}\right) = P$character, considering thatwithout it, the formulatowhich we can write the following:

$$TS = \frac{1}{1 + A\,S\,P}100\%$$

Here - aggregate mode work (work them walk speed and salt), S - field dimensions (height and width)and P - aggregate parameters into account the coefficient of the recipient network.

On the basis of the composition of the drive aggregate in relation to the dimensions of the treated area, the nomogram for determining the technical efficiency of the aggregateis drawn up, depending on the amount of the relative coefficient of the field sides (Figure 2).

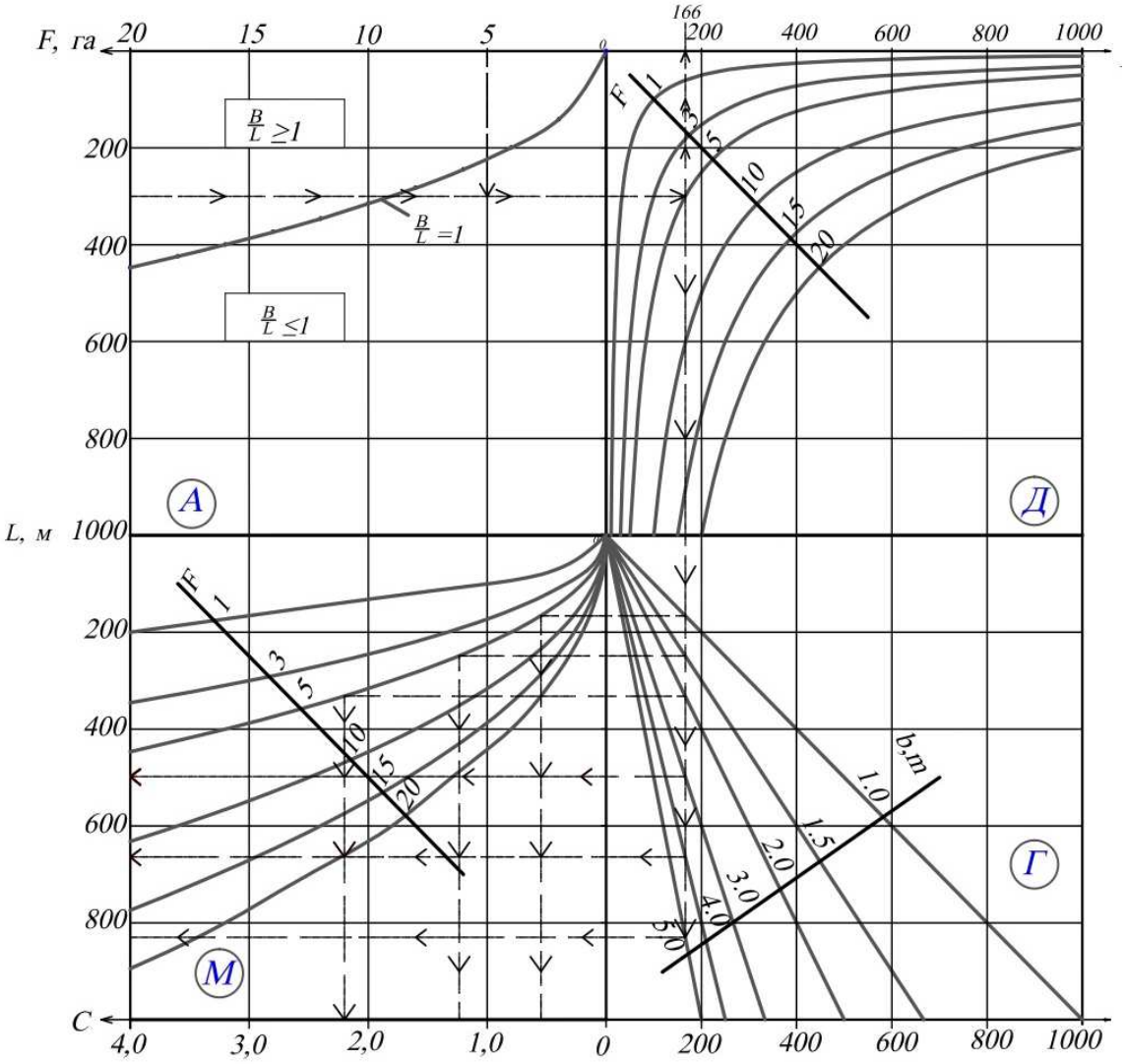

Figure 2. Nomogram of determining the optimal amount of the relative coefficient of the field sides affecting the technical efficiency of the aggregate

With the help of this nomogram, the procedure for determining the optimal amount of the relative coefficient (S), which affects the technical efficiency of the drive aggregate relative to the surface and length of each field area, has been developed and is carried out as follows

For example: if the surface of the field of the field (F=5m) and the length (L=300 m), then from the graph A (indicated by a bar line), the point at which these dimensions intersect is found, and the line D is directed towards the graph and continues until it meets the graph F=5 from this graph.

3. Conclusion

Then the bar line G is directed to the graph, where the intersection points of the aggregate with the coverage width (V_m) lines (1,0, 1,5 2,0, 3,0, 4,0 and 5,0 m) are found. From each intersection points, the bar lines M are oriented towards the graph, the area of the field F=5 is continued to the intersection points with the line, and accordingly the quantities of the relative coefficient of the sides of the field S1=0,52, S2=1,22, C3=2,2, C4, C5, C6>4 coefficients were determined.

According to the results obtained, the highest technical efficiency is achieved when plowing the field with this aggregate, since the relative coefficient of the field sides is equal to the smallest amount (S1=0,52) when the coverage width of the aggregate is 1 m when processing the area is F=5 and the field with the length L = 300 m.

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