ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 7, Issue 6 , June 2020

Basis of the Technique Method of Agricultural Turning Plow

GaybullaevBurkhonjon, ShavkatjonMamajanov

Candidate of technical sciences. PhD, head of the laboratory, Research Institute of Agricultural Mechanization (SRIAM),Toshkent, Uzbekistan
Researcher, Research Institute of Agricultural Mechanization (SRIAM),Toshkent, Uzbekistan

ABSTRACT: The article describes how tractors plow the land with a plow and the structure of the plows. The plows are different in structure. Nowadays, different types of plows are produced, and we can see the movement of these plows when tractors are plowing.

KEYWORDS: .plow, body, removable, formation, formation rotation process, the angle of inclination of the dumped formation to the bottom of the furrow, the depth of processing, the thickness and angle of cut of the cut off, removable part of the formation

I. INTRODUCTION

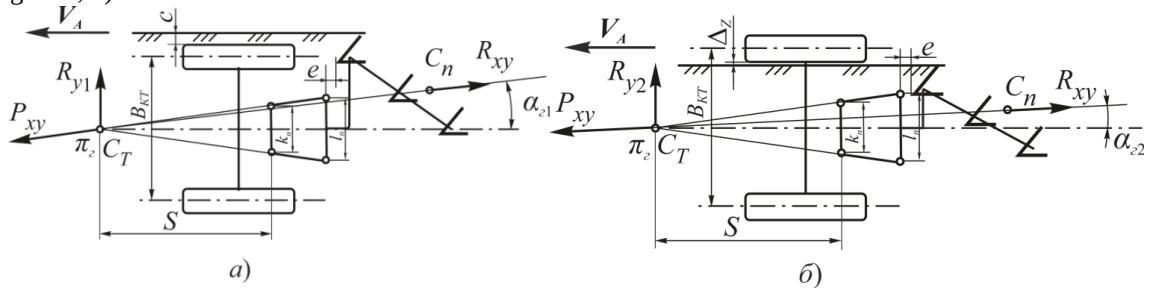
1. All the wheels of the tractor move in the furrow, ie on the uncultivated area (Fig. 1, a); 2. The right wheels of the tractor (when working with a simple plow) or the right and left wheels move in turn (when working with a turning plow) in the groove formed in the front passage of the unit

II. SIGNIFICANCE OF THE SYSTEM

The article describes how tractors plow the land with a plow and the structure of the plows. The study of literature survey is presented in section III, methodology is explained in section IV, section V covers the experimental results of the study, and section VI discusses the future study and conclusion.

III. METHODOLOGY

1. All the wheels of the tractor move in the furrow, ie on the uncultivated area (Fig. 1, a); 2. The right wheels of the tractor (when working with a simple plow) or the right and left wheels move in turn (when working with a turning plow) in the groove formed in the front passage of the unit
(Figure 1, b).



a) all the wheels of the tractor move in the mouth;b) one side wheels of the tractor move in the saddle
Figure 1. Schemes of aggregation of the plow with a tractor

When all the wheels of the tractor are moving in the groove 1, as can be seen from the diagram in Figure a, the center of resistance of the plug is located at a distance (in the transverse direction) from the longitudinal axis of the tractor S_p and arrow) and R_{xy} (where R_{xy} is the equal effect of the forces acting on the plug in the horizontal plane) form a large angle (angle αg_1 in Fig. 1, a). As a result, the lateral force $R_{xy}\ sin\alpha g_1$ acting on the tractor becomes too high, making it difficult to control the tractor.

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 6 , June 2020

In addition, in this case, the gravitational force acting on the plug will place an additional load on the field boards from the lateral component of the P_{xy}. As a result, the gravity of the plug increases.

IV. EXPERIMENTAL RESULTS

When the right or left wheels of the tractor move through the saddle
(Figure 1, b) The center of resistance of the plow is located on or near the longitudinal axis of the tractor. As a result, the lateral force $R_{xy}sin\alpha g_2$ acting on the tractor wheels is reduced and the risk of the tractor being pushed to the side is reduced.

The schemes shown in Figure 1 and previous studies
[2] according to

$$\alpha_{\text{с}1} = \arcsin\left(\frac{c + 0{,}5(b_{ш} + B_{KT}) - (n-1)b_{к}}{S + M + e + 0{,}5nL}\right) \quad (1)$$

and

$$\alpha_{\text{с}2} = \arcsin\left(\frac{0{,}5(B_{KT} + b_{ш}) - \Delta_{Z} - (n-1)b_{к}}{S + M + e + 0{,}5nL}\right), \quad (2)$$

where*S*-distance from the wall to the leading wheel, m;
b_{sh} - width of the tractor tire, m;
B_{kt} - tractor collar, m;
n -number of plug housings, pcs;
S - lower suspension of the tractor suspension
the pressure of the wheels from the point where it is connected to it
longitudinal distance to the center, m;

$$M = \sqrt{l_{б}^{2} - 0{,}25(l_{n} - \kappa_{n})^{2}} - (H + a - H_{1});$$

l_b - lower longitudinal traction of the tractor suspension mechanism
length, m;
l_p - lower hanging (tie) points of the plug hanging device transverse distance between, m;
k_p -lower longitudinal traction of the tractor suspension mechanism transverse distance between points connected to the tractor, m;
H-lower of the suspension mechanism from the base plane of the tractor the anterior hinges of the traction are vertical to S (S1)distance, m;
a - driving depth, m;
N_1 is the bottom of the hanging device from the base plane of the plug vertical distance to the point of tie, m;
e - from the lower hanging point of the plug to the first housing longitudinal distance, m;
L - longitudinal distance between the plug housings, m.
Given the expressions (1) and (2) and R_x = nkabk (where R_x is the gravity of the plow; k -relative resistance of the soil to plowing; a-depth of tillage; b_k-width of the plow body). The lateral forces acting on the tractor by can be expressed as follows

$$R_{y1} = n \cdot \kappa \cdot a \cdot b_{к} \cdot tg\left(\frac{c + 0{,}5(b_{ш} + B_{KT}) - (n-1)b_{к}}{S + M + e + 0{,}5nL}\right) \quad (3)$$

and

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 7, Issue 6 , June 2020

$$R_{y2} = n \cdot \kappa \cdot a \cdot b_{\kappa} \cdot tg\left(\frac{0{,}5(B_{KT} + b_{ш}) - \Delta_Z - (n-1)b_{\kappa}}{S + M + e + 0{,}5nL}\right), \quad (4)$$

p = 3; k = 6·10^4 Pa; b_k = 0,45 m; a = 0,3 m; s = 0,3 m; b_{sh} = 0,393 m; B_{KT} = 1,8 m; Δ_Z = 0,1 m; e = 0,24 m; S = 1,387 m; l_b = 0,8 m; l_p = 0,8 m; k_p = 0,48 m; N= 0,73 m, N_1 = 0,65 m

The calculations carried out on expressions (3) and (4) show that when all the wheels of the tractor are moving in the groove, one side is affected by 5.2 times more lateral forces than when the wheels are moving in the groove.

V. CONCLUSION AND FUTURE WORK

These methods of movement have their own advantages and disadvantages. The advantage of the first method is that when the drive unit is running, the tractor's motors operate under the same conditions, ie they all move along the field surface and the tractor is in a horizontal position. This method also removes soil compaction with tractor wheels using a plow. The disadvantage of this method is that, as noted above, it is difficult to balance the forces of the tractor and the plow in the horizontal plane and control the unit, and the tractor is constantly forced to watch it move parallel to the wall of the field formed in the previous passage.

The advantages of the second method are the balance of forces in the horizontal plane of the unit and the ease of its control, the reduction of the traction resistance of the plug, and the disadvantages are:

- tractor engines work in different traction conditions;
- the slope of the tractor worsens the working conditions of the tractor, especially when driving deep;
- Under the influence of tractor wheels, soil compaction occurs at the bottom of the field, which cannot be eliminated by the plow.

Aggregation in the first method is common in the United States and Russia, and aggregation in the second method is common in Western European countries.

Based on the above, during the plowing process, the method of moving the left or right wheels of the tractor through the furrow formed in the front passage of the drive unit was selected.

REFERENCES

[1]. Sineokov G.N., Panov I.M. Theory i raschetpochvoobrabatыvayushchix machine.- M.: Mashinostroenie, 1977.–328 p.
[2]. Mansurov M.T. Scientific and technical solutions for the aggregation of tillage machines consisting of front and rear working parts of wheeled tractors.Texn.fan.dok. diss. - Tashkent, 2018.- 208 p.
[3]. Mamatov FM Agricultural machines. - Tashkent: Fan, 2007. - 339 p.