

# Technical Analysis of Plug Software When Working Between Gardens

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**ABSTRACT:** Traditional plows are still used for autumn and spring plowing between rows. When plowing with traditional plows, marzes and ditches are formed on the plowed area, which requires the use of additional leveling machines for subsequent work. This, in turn, leads to an increase in processing time. Plowing with a softener plow between the rows leads to increased energy savings and increased productivity of the cocktail.

**KEY WORDS:** plow-softener, cork, weed, sloping handle.

## I.INTRODUCTION

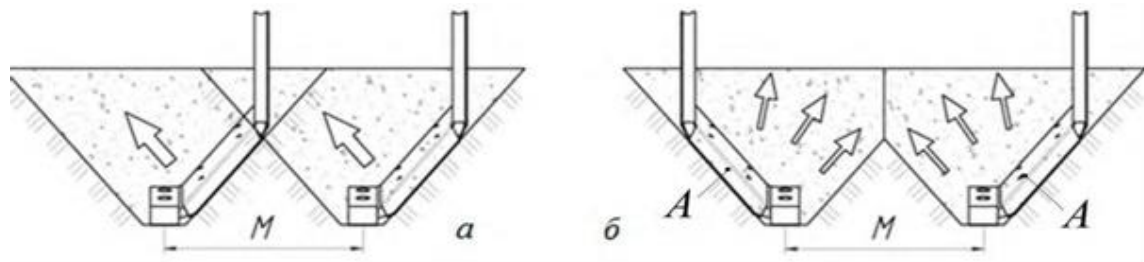
One of the main tasks of row spacing in the garden is to create favorable conditions for the good development of the root system of tree seedlings and the removal of weeds that germinate between the rows in spring. Accumulation and storage of moisture from snow and rain in winter and spring during soil cultivation, rational use, improvement of aeration, destruction of weeds and pests, fertilization during inter-row cultivation, good growth and development of trees, creating conditions is the most important task. The garden consists of autumn and spring plowing, chiselling, spring-summer cultivation, deep loosening of the soil between the rows.

In particular, autumn plowing of the soil between vineyards is aimed at improving the physical and chemical properties of the soil, creating a maximum moisture reserve in it until spring. To protect the vineyards for the winter, it is recommended to simultaneously dig in the soil between the rows of vines to a depth of 25-30 cm to bury the dust. These works are plowed with plows PLN-4-35 or PLN-3-30, created for the conditions of Central Asia by the Tashkent city branch of the Design Bureau of Horticulture and Viticulture. To protect the vines for the winter, it was preferable to deepen the current between the vines.

In winter, to protect the vine, the above-ground part of the vine is buried with loosened soil, the vine grown by the traveling method is plowing in the traditional way, and in spring it is deeply plowed with a chisel.

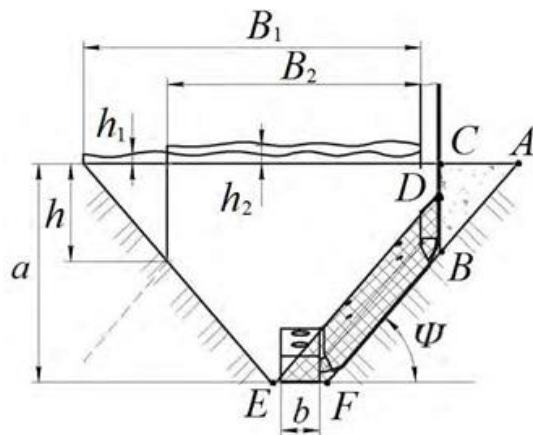
Spring tillage allows you to create conditions for good moisture retention, helps to eliminate weeds, diseases and pests. For some reason, when the soil between the rows of orchards and vineyards is not cultivated in autumn, processing is carried out in early spring, before the vines bloom and sprout. In the spring they are plowed in the same way as in autumn, and the vines are opened and the trees are watered. After opening the currents in the spring-protected soil layer, current is carried out using planners of different brands to level the soil between rows. The repeated passage of tractors and other agricultural machinery through the rows of vineyards leads to the compaction of the plowed soil. The compacted soil between the beds makes it difficult for moisture and air to enter the lower layers of the soil. After spring work (in April), the soil is plowed to a depth of 25-30 cm to remove weeds and plant debris that have grown in the spring between the rows of the garden. The soil in the vineyard is cleared of weeds after plowing. This is achieved by regular (three-four times in summer) processing of row-spacings with plugs or chisels PLN-4-35 and PLN-3-30 to a depth of 10-12 cm. Inter-row processing is carried out after each watering, and even after rain. Summer surface tillage removes weeds and forms a loose layer on the soil surface, which helps to retain moisture in the area where the main part of the tree roots is located, improve the water-air and nutrient regime of the soil. From time to time, every two to three years, the soil in the middle of the aisle is loosened to a depth of 50-60 cm. Currently, the use of the Paraplovo tilt-arm softener plow, which is more energy efficient than the traditional tillage method, reduces energy savings with 30% less drag than traditional plows and eliminates the remaining plow compensation from plows. thanks to which it retains moisture well. Today, new parks are being created in Uzbekistan, mainly in the foothills of the foothills. This, in turn,

requires the efficient use of labor and energy in the cultivation of garden spacings. In addition to maintaining the overall soil layer during tillage without tipping over, the introduction of weeds and crop residues remaining on the soil surface prevents soil and water erosion. In addition to the quality of tillage, the placement of the working bodies in the frame when cultivating the soil with the proposed inclined plow-softener also affects the resistance of the working bodies to movement, as can be seen, the efforts are formed as follows.



**Figure 1 - Schemes of the location of the working bodies of the plow-ripper**  
a- the classic layout of the working bodies; b - the proposed layout of the working bodies

As a result of scientific research, it has been established that these replaceable softeners depend on the longitudinal and transverse distances between them based on the layout. Combining the forces created by the softener plug with an inclined handle with the design of the softener plug, we obtain the following expressions.



**Figure 2 Scheme for determining the parameters of the treated formation**

$$h_i = \frac{F_{BDEF}}{B_i} \quad (1)$$

$$m_h = \frac{h_2 - h_1}{h_1} \cdot 100\% \quad (2) \quad m_h = \frac{\frac{F_{BDEF}}{B_2} - \frac{F_{BDEF}}{B_1}}{\frac{F_{BDEF}}{B_1}} \quad (3)$$

$$m_h = \left( \frac{B_1}{B_2} - 1 \right) \cdot 100\% \quad (4) \quad G - h = 0,5(M - b) \cdot \text{tg} \psi \quad (5)$$

$$\psi \approx 45^\circ \quad B_1 = G + 0,5(M + b) \quad (6) \quad B_2 \approx M \quad (7)$$

Where b is the width of the beam, h - is the distance from the inclined handle to the inclined plane, B1 is the deformation zone of the inclined handle-softener plunger, B2 is the distance between the inclined holders, a-is the depth of the inclined fork-softener in the ground, h1-formed on soil surface indent height, h2 - indent resulting from soil deformation between the working bodies, the slope of the ps-sleeve-softener relative to the vertical plane. If we analyze scientific studies and field tests, it can be seen that as the lateral distance between the inclined handles increases, the quality of soil compaction decreases and the quality of soil compaction decreases.

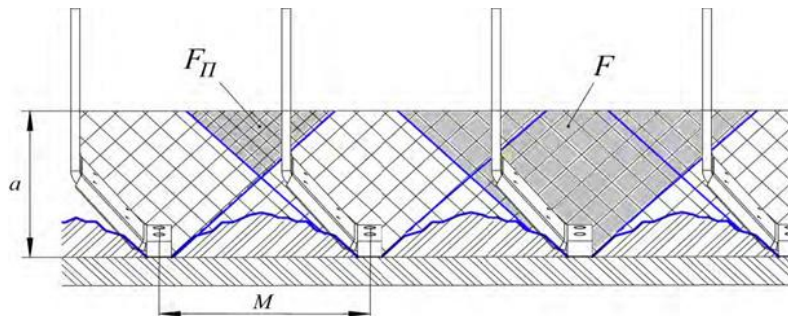


Figure 3 - Scheme of processing the soil layer plow-ripper with swept arrangement of working bodies

$F$  is the cross-sectional area of the soil layer processed by one working body;  $F_{II}$  - cross-sectional area of the soil layer, processed repeatedly by the neighboring working body. This figure shows the state of deformation of the soil during tillage at the location of the tilt-arm plow and the formation of uneven ridges under the plow in tilt-arm plows. In the picture shown,  $M$  is the longitudinal distance between softener plugs with an inclined handle.

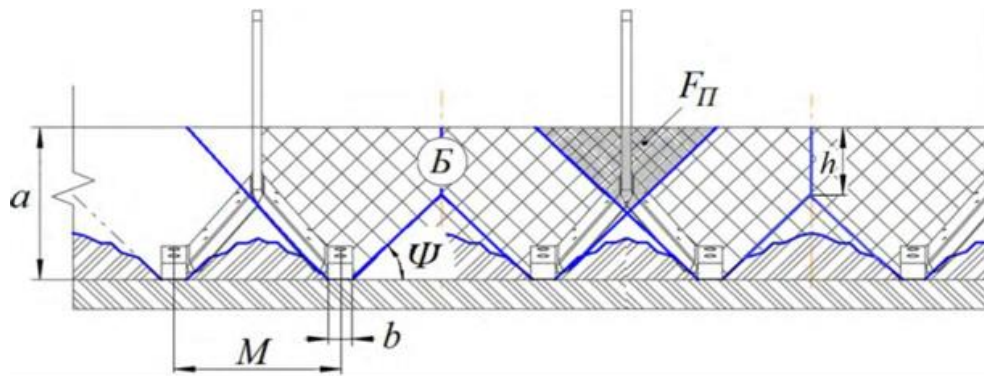


Figure 4 - Scheme of processing the soil layer by the working bodies of the improved plow-ripper

It is important that the system of tillage and each method of its cultivation be scientifically sound, taking into account environmental conditions, energy-saving, taking into account the characteristics of the area. To date, to preserve and increase soil fertility, the method of deep tillage without overturning the row spacing of the garden is widely used. Although plowing with traditional plows of various sizes and plowing depths leads to the elimination of spring weed diseases by leaving them in the soil, the plow formed as a result of continuous plowing does not absorb seasonally applied mineral fertilizers between vegetable garden rows.  $\gamma$  causes a level up. When working with a softener plow with an inclined handle on the soil in garden rows, a 5-10 cm compacting roller is located on the back of the softener plow. As a result of field tests, it was found that the part meets the agrotechnical requirements for plowing, ensuring its formation at a rate of 14-16%. It has been established that soil moisture retention is better when plowing 43-48% of the soil per year than when plowing between rows with plows, compared with conventional plow tillage with a softener plow without tilting the soil. As a result of scientific research conducted by D.N.Pryanishnikov, when using plows PLN-4-35 or PLN-3-30 in the traditional way, the moisture capacity and porosity of the soil decreased by 33% from year to year.

Given that the aisle of the garden is focused on maximum soil moisture and its economical use when processing with traditional plows in early spring, large moisture losses in the spring-summer period are due to its evaporation of moisture from the soil surface and inefficient use of weeds for growth and development. On sunny days, evaporation of moisture reaches 4-6 mm per day. Softening of the top layer of soil without overturning reduces the rapid evaporation of moisture by 1.5-2 times.

In conclusion, we see that tillage without soil turnover for 2-3 years is very important for maintaining soil fertility and increasing its porosity.



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