

## Equipment of Small Mechanism for the Preparation of the Germinating Bed in Small Individual Households

Ion MĂRUNȚELU

*Transilvania University of Brasov, Department for Engineering and Management in Food and Tourism,  
148 Castelului Street, Brasov 500014, Romania  
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**Abstract:** The paper presents an innovative method of preparing the germinating bed on small fields as surface from the small peasant farms. Preparing the germinating bed for sowing or planting is a complex process of digging, harrowing, pruning and leveling the soil. All these operations can be performed simultaneously with a simple technique equipment of small mechanization characterized by low energy consumption, high efficiency and superior quality of the work according to agro technical requirements. The idea of this equipment went from a hand-operated tool to work the soil that the Russian gardeners successfully use, being adapted to a mechanized working process.

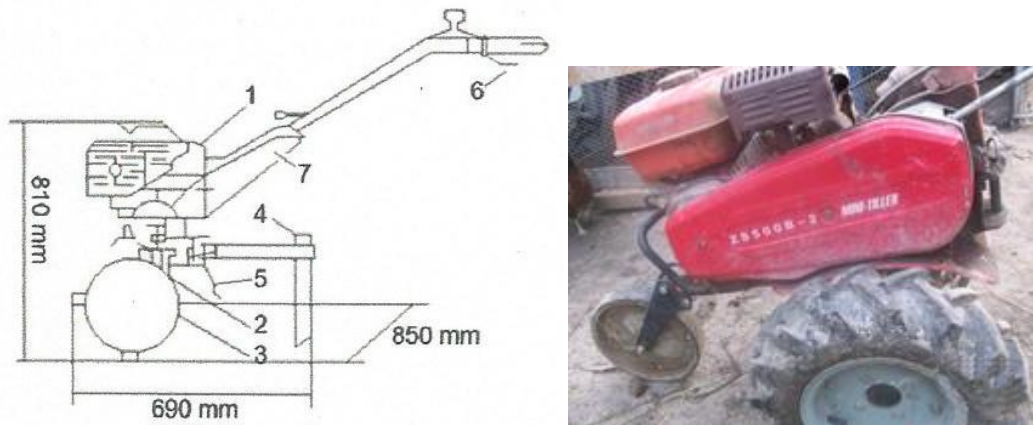
**Keywords:** germinating bed, tiller, technical equipment, mechanized working process

### I. INTRODUCTION

Small individual or peasant households have a large share in Romanian agriculture, accounting for 53.5% of the agricultural area of the country. Generally, these households have small land areas, limited to family gardens or small land plots near the house. As a result, householders have two problems to solve: soil cultivation for sowing or planting and weed removal. The future of Romanian agriculture is organic agriculture, because in many situations the land is degraded, in other situations it is unbalanced, lacking in organic matter. This is especially important to improve and increase soil fertility. Large-scale householders use to prepare the germinating bed different kinds of hand tools such as: splinters, diggers, mattocks, rakes etc., which require a high physical effort and low yield. Nowadays, more and more householders have begun to use various soil cultivation tillers for soil cultivation that achieve both precision in soil processing and a deeper working depth. Being known as "motor digger", the tiller is a machine that not only makes it easier but also maintains the soil and prepares it for further work. It can be equipped with various earthwork equipment and accessories.

### II. MATERIAL AND METHOD

When preparing the germinating bed, the soil must be dug, pitched, pruned and leveled to saturate it with oxygen. Hand tools generally used by householders usually perform these operations individually and require a high physical effort. In order to reduce the physical strain and the duration of the germinating bed preparation process, we have developed a small mechanization equipment that simultaneously fulfills the role of hoeing, fork, rake and rake. This innovative equipment, besides facilitating work, improves the quality of the soil process. The digging of the soil with the traditional tool (dummy, spade) requires a great effort. With such a manual tool it raises with the arms tones of earth during the work process and can affect the user's health. In addition, with this classic manual tool, the weeds are cut into pieces and left on the ground swiftly. By using such equipment, soil work on farmland can be performed by even older people or children, as it significantly reduces physical effort and can transform the user's workflow into easy or even fun training. The technical soil processing system is made by 6 CP power turbocharger (Figure1) and equipment adapted to perform several operations simultaneously (Figure2).



**Figure 1:** *Cultivator 6 horsepower*

- 1- engine unit
- 2- reducer
- 3- wheels
- 4- depth limiter
- 5- protective guard
- 6- clutch lever
- 7- horn support (handlebars)



**Figure 2:** *Tillage device*

The equipment is driven by a double chain transmission from the support and displacement wheels of the tiller. For the chain drive operation of the equipment, a chain wheel (Figure 3) was applied to the tiller wheels on the side.



**Figure 3:** *Drive system*

The working process is carried out by moving the technical system to the backrest of the tiller. The equipment is fixed to its front on its frame. From the supporting and rolling wheels, through the double chain transmission (Figure 4), the movement is transmitted to a double quadrilateral mechanism that acts further on the working bodies of the type bayonet-like equipment.



**Figure 4:** Innovative equipment for tillage

#### IV. CONCLUSIONS

- ❖ At one passing it is ensured simultaneously digging, pruning and leveling the soil on a depth of 25-35 centimeters;
- ❖ Helps control weeds effectively as a result of their uprooting, not stemming the stems;
- ❖ Reduces physical effort compared to other traditional tools, especially backbone work;
- ❖ Greatly increases labor productivity;
- ❖ Easy maintenance.

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