



GERMINAL BED PREPARATION ON THE LANDS OF THE INDIVIDUAL HOUSEHOLDS

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Abstract: This paper presents a study on the methods of preparing the seedbed on the lands near the house, which ensures a sowing quality, namely: seed germination, emergence uniform plant, achieving optimum density and finally obtaining high quality yields as organic as they can be. Soil is the source and supporter of life. That is why it is necessary to use agro-pedological technologies to protect it and to minimize its physical, chemical or biological degradation. Because of the flawed management, conventional agriculture is struggling with complex problems that reduce soil fertility and its continuous degradation. The preparation of the seedbed on reduced lands of small households is generally done through traditional manual or mechanized works but which could be replaced by specific production technologies called "permaculture" or permanent agriculture. Agriculture is sustainable only if it is organic and produces healthy food.

Keywords: germinal bed, soil degradation, individual households, conventional works, permaculture.

1. INTRODUCTION

To ensure proper conditions for seed germination, it is necessary to make "a hard bed and a soft blanket" in the preparation of the seedbed [8]. Soil works in the preparation of the seedbed is a "necessary evil". This conclusion is based on a complex long-term assessment of the positive and negative effects of these technological concepts on the environment and the quality of the products obtained [7].

The need for soil cultivation has been perceived by humans since ancient times, the first agricultural tools being the ones to be used on working the soil.

Mistakes made in soil works may have effects later felt for many years. Therefore, it is necessary to take the following measures [6], [9]:

- soil works have be made as shallow as possible in order not to destroy natural capillarity and not to destroy the activity of pedo-fauna
- the frequency of works should be reduced to minimum in order to reduce soil compaction

In the preparation of the germinal bed there are different situations depending on the soil humidity, the type of soil, the range of tools used, the amount of vegetal remains left from the previous crop, the depth of sowing, the size of the seeds. Soil processing through deep, uneven works, makes the seed embedded at different depths, its germination is staggered and weeds and pathogens may appear.

The germ cell corresponds to agro technical requirements when (fig. 1):

- the soil surface is coarse, avoiding crust formation that would prevent plant growth
- the soil layer where the seeds are placed is fine, allowing the water to come into contact with the seeds
- the soil layer on which the seeds are placed is easily compressed
- the base of the germinating bed is deeply immersed, ensuring an optimal aero-hydric regime for plant growth

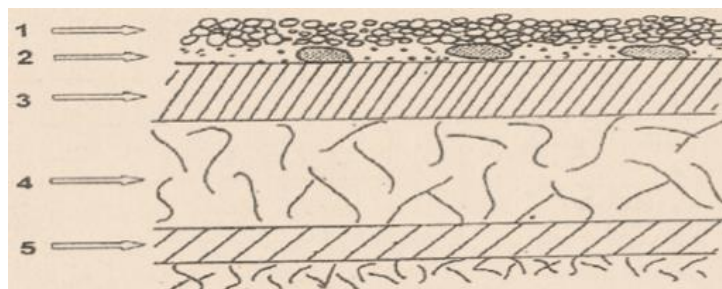


Figure 1: The ideal germinating bed structure 1. bulgarian soil layer; 2. fine soil layer; 3. tiled soil layer (germinating bed base); 4. treated soil layer; 5. the base of the processed soil layer (long drawn) [3]

2. MATERIALS AND METHOD

When preparing the germinating bed, on the land surfaces near the house, in the case of peasant households, the conventional work system is generally used using manual or mechanized tools.

The first operation for the preparation of the germinating bed in these situations is the cleaning of the land by the vegetal debris of the previous crop, which is done by hand, with a rake, some being used in animal feed. If the land remains heavily buried, the weeds are mown, they are taken to the edge of the plot where they are composted or burned. The perfect release of plant debris from the previous crop facilitates the soil processing process. It is recommended that soil treatment be done immediately after it has been released from the vegetal debris, thus this way it is kept free of weeds and without the crust and greatly reduces the loss of water by evaporation to the surface of the soil. After removing the vegetal debris, the soil is cultivated by subsoil or surface plowing, grappling and raking so that the soil is leveled to prevent water pouring, modeled for irrigation by the creation of balls or raised layers [6], [8], [9].

The germination bed preparation works are divided into three groups:

- for spring sowing or planting
- for summer sowing or planting
- for autumn sowing or planting

For cultures that are set up in spring, the works are carried out with the main purpose of warming the soil as quickly as possible, by performing several loosening tasks by drilling or raking.

In cultures that are set up in the summer, these being usually successive crops, germination bed preparation refers to the removal of plant debris, the desolation or the shallow plowing followed by grape or rake. If the land is too dry, the watering standard is applied before the germinating bed preparation.

The summer worked lands do not have to be too lousy, because they cannot provide enough water to allow quick germination of seed or harvesting [7], [8].

In crops that are set up in autumn, seedbed preparation works are made only for crops that are resistant to cold and can be sown or planted during this season. The preparation of the land also involves the removal of the plant debris from the previous crop, the dump and the grapple or the rake for crushing and leveling the land, as well as the modeling of the land for irrigation [8].

The manual tools for preparing the germinating bed in the peasant farms are: spades, diggers, mattocks, rakes.

The spades are especially used for manual mopping and can be used in several models:

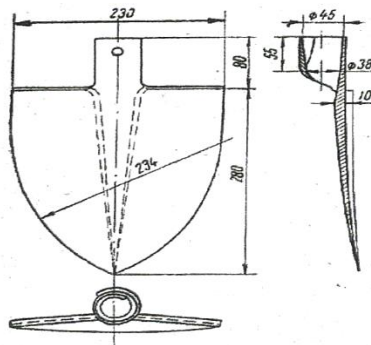


Figure 2: Type "A" spade [2]

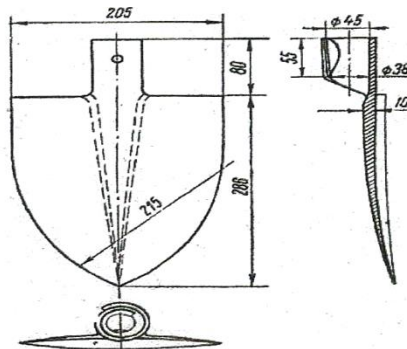


Figure 3: Type "B" spade [2]

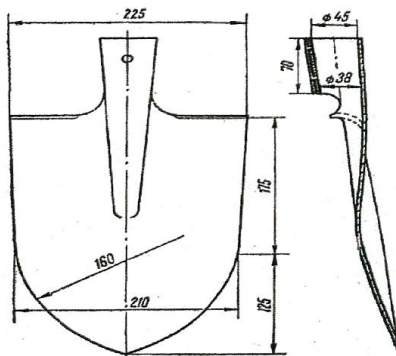


Figure 4: Type "C" spade [2]

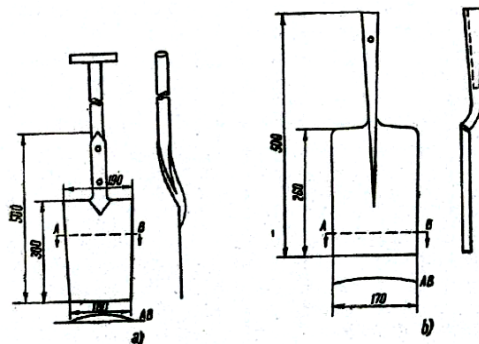


Figure 5: Rectangular and trapezoidal shape spades [2]

The hoes are generally used for crop maintenance, but on small areas in households, they are also used to prepare the germinating bed, using different models depending on soil and relief conditions.

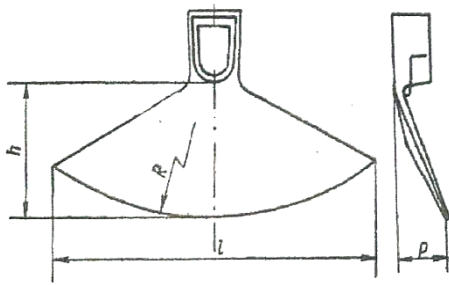


Figure 6 :Type "A" hoe [2]

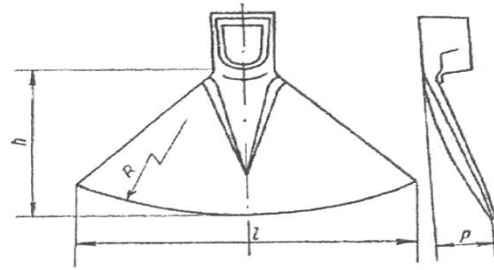


Figure 7: The Drăgășani type "B" hoe [2]

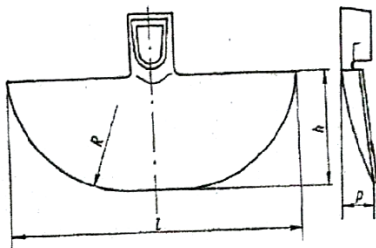


Figure 8: Type "E" gardening hoe [2]

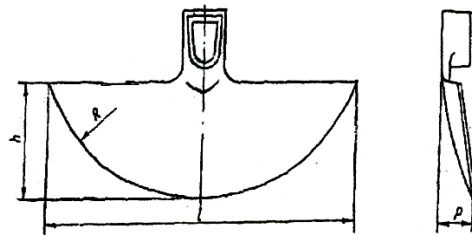


Figure 9: The Bulgarian type "H" hoe [2]

The mattocks are used in the preparation of the germination bed especially in the culture of vegetables and flowers and can be:

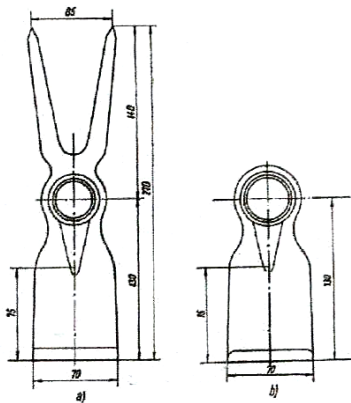


Figure 10: The mattock with blade with or without fork [2]

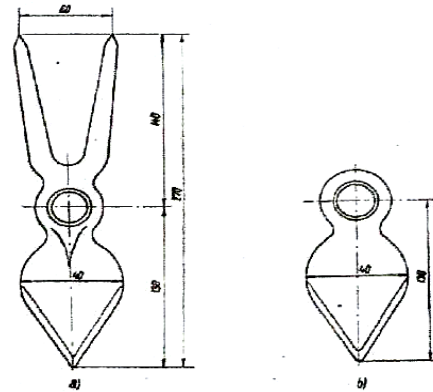


Figure 11: The mattock with heart-shaped blade with or without fork [2]

The rakes are used for the preparation of the germinating bed, especially in the vegetable domain and floriculture, performing manual shredding, leveling and soil modeling, as well as the gathering of vegetal remains.

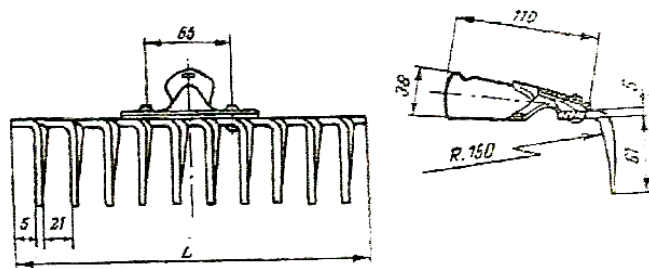


Figure 12: The rake for crushing, leveling and bending the soil [1]

On small surfaces in the peasant farms, on a large scale are used different models of tillers, achieving precision both in soil processing and deep working depth. As a result, in order to work the soil in a short time and without back pain, using the tiller is an ideal solution, being a simple, easy to handle and maintained machine. In addition to maximum yield, the soil is evenly worked regardless of its type and the degree of inclination.

For the preparation of the germinating bed, the tillers can be equipped with a series of accessories and equipment for working the soil such as plows, mills, grapples, cultivators, rollers etc. as in the case of technical systems with agricultural tractors but of small size adapted to their power.

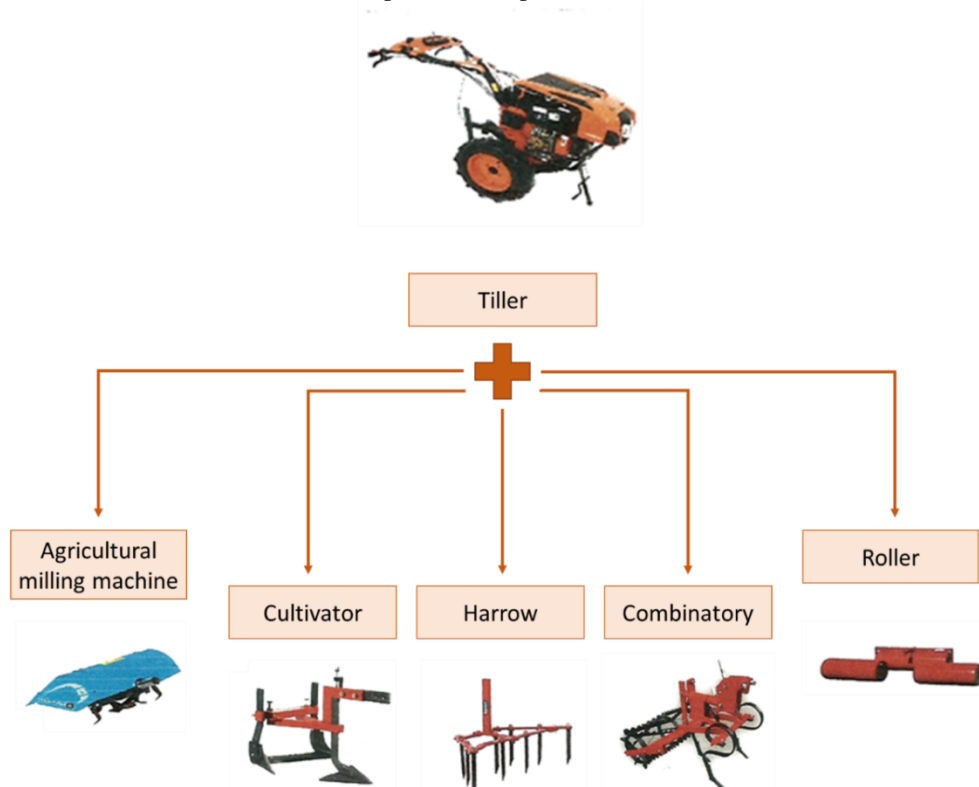


Figure 13: Technical systems for germination bed preparation with tillers

The use of traditional seedbed preparation systems may have negative effects over time, generating complex problems in soil fertility and its degradation. That is why, on the reduced surfaces in individual households, the conventional system of works can be replaced with an ecological technology called "permaculture"[10], [11]. This is an innovative method inspired by natural systems that can ecologically and economically rehabilitate lands, especially around individual households, implementing a healthy, environmentally friendly model of life. Permaculture or permanent agriculture has as main concern the creation of systems for people to serve their needs, using natural elements and inspiring from natural ecosystems [13], [15].

Most householders who own a land near the house complain of two things: soil digging and weeding (weed removal). The land without dig can be prepared if one adds the following in this order: newspapers or cartons, manure (manure) and straw mulch [10], [14].

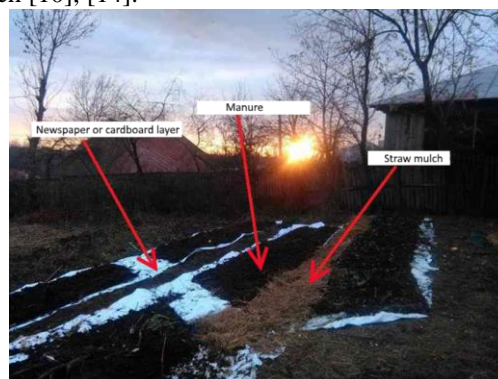


Figure 14: Land of permaculture [10]

Maintaining a thick layer of mulch, the manure transforms into humus, and because of cardboard and straw, weeds are almost non-existent. Under the straw protection, the soil remains moist for a long time, the need for irrigation is reduced, the beneficial microorganisms are rapidly growing. The straw protects the soil from the force of the rainfall, and as a result of the fact that the access is made on well-defined parcels, the soil remains permanent loose [10], [11], [13].

3. RESULTS AND DISCUSSIONS

Due to management, householders throw more and more money on fertilizers, pesticides, some of the land plots under water and others drought. Fertile soil disappears; biodiversity is limited to just a few insects. Climate changes brings drought, floods. Through a careful planning and use of specific technologies, permaculture applies innovative methods valid in both ecological and traditional farming.

Agriculture is sustainable only if it is organic and produces healthy, non-chemical food. Conventional agriculture has a long way to go, but using permaculture techniques reduces the use of chemicals and reduces energy consumption. The result, healthy agricultural products with a good taste. The effort is reduced and the production is of superior quality 100% ecological.

4. CONCLUSIONS

- Permaculture techniques produce significant results: healthy food, soil regeneration, biodiversity is growing;
- Permaculture takes care of the soil, care for people, helps to limit the consumption of resources;
- Permaculture creates stable, productive systems that meet human needs;
- Permaculture offers a sustainable alternative, which first aims to regenerate the ecosystem, bringing gradually and increasing production; sustainable means that it takes care of all the resources: soil, water, air - improving them from year to year;
- Using natural resources to compensate for imbalances without toxins, oils or other inappropriate means used in industrial agriculture, permaculture respects the environment, fauna and flora.

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