AJEMA GLOBAL RESEARCH NETWORK

AMERICAN Journal of Engineering, Mechanics and Architecture
Volume 01, Issue 09, 2023 ISSN (E): 2993-2637

Ways To Achieve Energy And Resource Savings In Soil Preparation And Planting

L.Kh. Gulomov
supporting doctoral student
Karshi Engineering - Economics Institute, Karshi, Uzbekistan

Abstract: The article describes the ways and measures to achieve energy efficiency in the cultivation of soil, its preparation for planting.

Keywords: soil, processing, energy, resource saving, technology, mechanical processing, erosion, tillage, technical, technological, minimal, fuel, raw materials, productivity.

Introduction

In the world, the development and use of energy resource-saving and high-performance soil tillage machines while maintaining soil fertility for the cultivation of agricultural crops and obtaining high yields from them occupies a leading position. In the agricultural practice of the world, along with the basic processing of the fields before planting crops, research and development activities are being conducted aimed at developing resource-saving technologies of preparing the soil for planting and the new scientific and technical bases of the technical means that implement them.

Our republic has taken comprehensive measures to reduce labor and energy consumption in agricultural production, save resources, prepare land for planting on the basis of advanced technologies, grow agricultural crops on the basis of advanced technologies, and develop high-performance agricultural machines. measures are being implemented, including the development of technical tools that ensure high-quality performance of all technological processes by preparing the fields for planting, using less energy, and at the same time preparing the soil for planting.

Soil cultivation is one of the technological processes that require the most labor and energy in the production of agricultural products. In agricultural production, 70 percent of labor and energy costs are spent on growing crops, including soil cultivation, which accounts for 40 percent of it [1].

The development and application of technologies and technical tools that save energy and resources, increase soil productivity, and protect the soil ecologically, occupy a leading place in the current world practice. Energy and resource saving can prevent soil compaction under the influence of tractors and agricultural machines, reduce the number of mechanical tillage, maintain soil fertility, protect soil, prevent water and wind erosion, production costs and agricultural It is important to reduce the cost of food products.

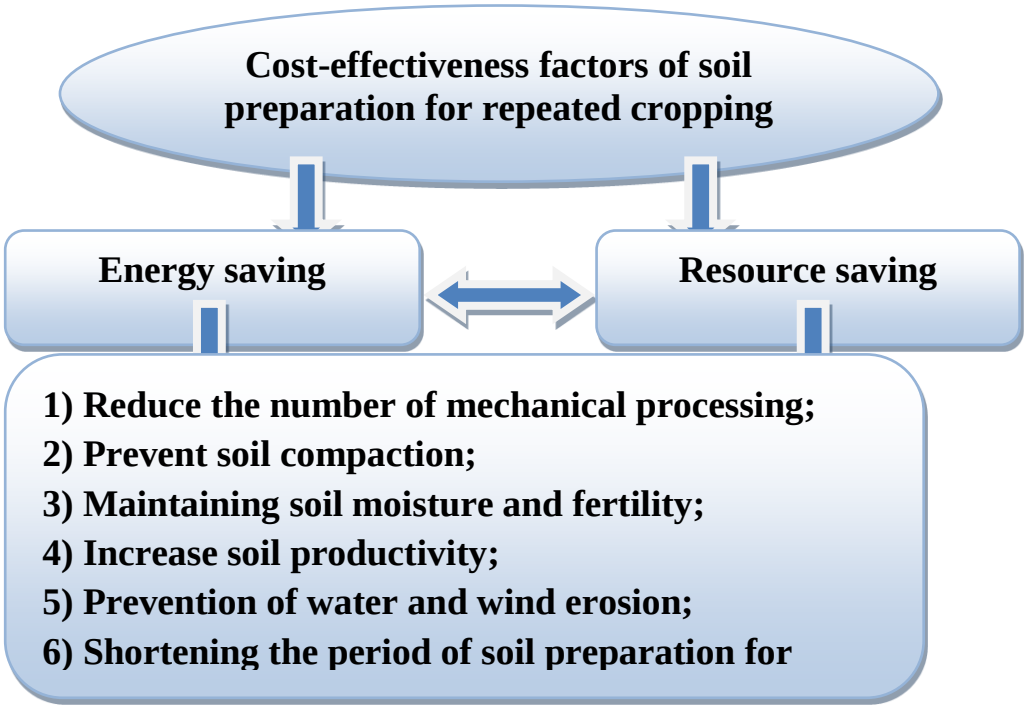
DISCUSSION AND RESULTS.

According to the analysis of scientific and technical and patent literature, the factors of economy in tillage are energy economy and resource economy. Economical technologies should be aimed at preserving the fertile layer of the soil and moisture, fighting against water and wind erosion. In such technologies, each operation can be carried out by tilling the soil with or without turning the working bodies. In some technologies, it can be done on the basis of zero or minimal

tillage, keeping plant stems and root residues on the surface of the field [3,4].

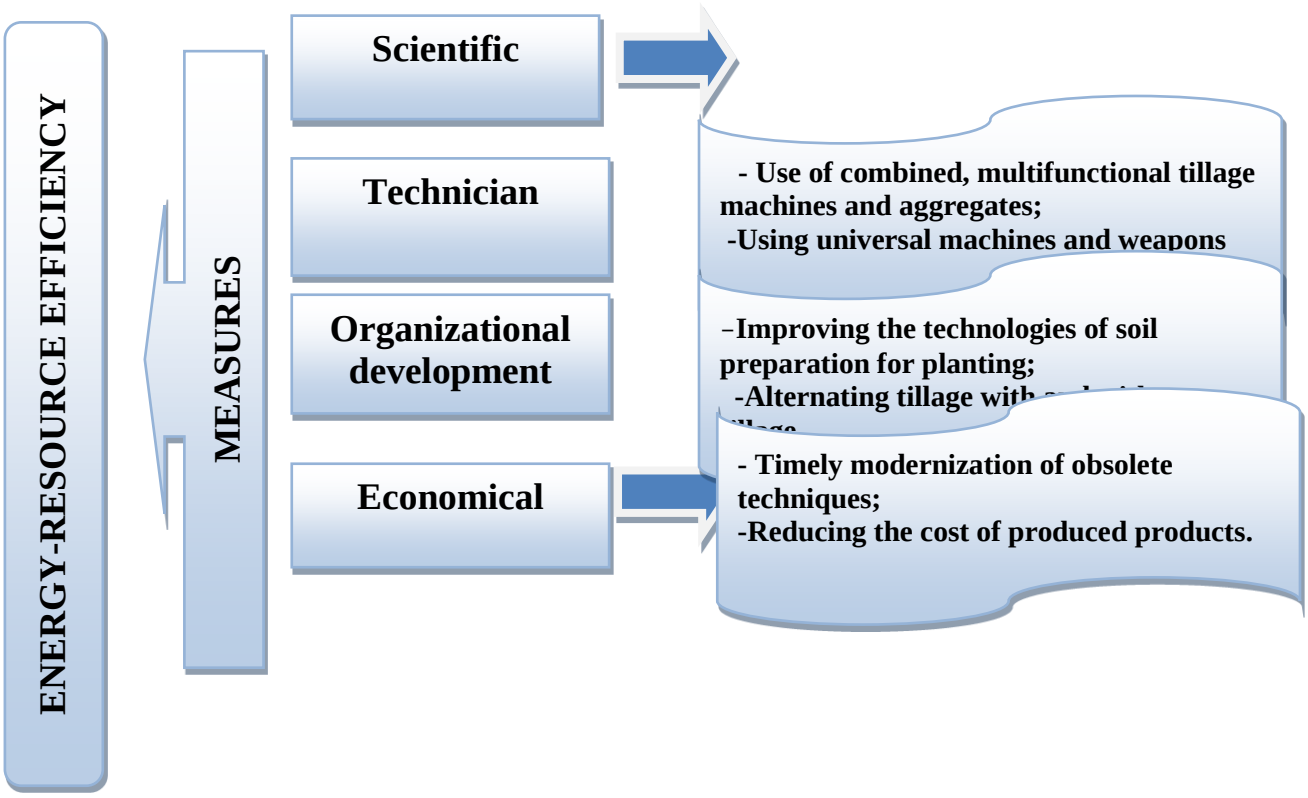
The main task of agriculture is the development and introduction of energy and resource-saving technologies that will treat the soil with quality and fully prepare it for planting. Saving resources is one of the priority tasks of the economy of Uzbekistan. This is primarily due to the rarity of many resource sources, the main ones of which are presented in Figure 1 [5].

In recent years, the trend of increasing the area of zero tillage and direct planting is evident in world practice [3]. However, such cultivation methods increase the number of weeds, which requires more use of herbicides and plant protection products, resulting in a significant increase in the cost of production.



Picture 1. The main economic factors in tillage and preparation for planting

In order to reduce the operating costs in the cultivation of agricultural crops, it is important to carry out several technological operations at the same time, as well as to develop and implement the technologies of soil protection and erosion control machines. For this, a comprehensive and combined tillage machines and aggregates are required. Maintaining soil fertility, protecting the environment, and improving ecology are important, requiring minimal use or complete avoidance of these herbicides [5].



Measures and ways to achieve energy saving (Fig. 2) consist of the following, scientifically - development and introduction of new energy-saving technologies of soil preparation for planting; application of innovative machines and weapons, technically - use of combined, multifunctional tillage machines and aggregates; use of universal machines and weapons; in terms of organizational production - improvement of soil preparation technologies for planting; alternating tillage and tillage; economically - timely modernization of obsolete techniques; is to reduce the cost of the produced product.

As a result, the focus is on achieving the single goal of reducing overall costs, maintaining soil fertility, and increasing yields.

In turn, each of these requirements is characterized by certain parameters:

technological - maximum perfection that ensures simultaneous execution of technological operations while maintaining soil fertility;

technical - simple construction, interchangeability of working parts and details, availability of maintenance and repair of all units and mechanisms, minimum length, mass and maximum possible width of the unit;

energy efficiency - the possibility of combining several operations at the same time, minimal consumption of fuel and lubricants;

resource saving - minimum consumption of metal volume of machines and weapons;

use - safe, highly maneuverable, capable of working on different terrains, maximally efficient, performing technological operations with high quality, adjustable in a wide range, technically reliable;

economic - the minimum value and cost of use of technical means.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the research, the following can be concluded:

1. According to the observations of researchers and experts, the use of effective energy-resource-saving technologies reduces the number of aggregates passing through the field, minimizes tillage and preserves its productivity, and prevents environmental pollution.

2. Resource-saving technologies should consume the least amount of fuel and raw materials, reduce labor costs, increase productivity, save natural resources, protect the soil ecologically and not harm the environment.

3. Based on the above, it is an urgent issue to create and use combined machines that work the soil and prepare it for planting on the basis of energy and resource efficiency, taking into account the soil and climate conditions of our Republic.

References

[1]. Kh.A. Fayzullayev.//Establishment of the parameters of the combined machine that prepares the soil for planting polys crops under the film // Dissertation-Tashkent-2019

[2.] Patent RF 205451. Pochvoobrabatyvayushchee orudie dlya bakchevodstva / Aldoshin N.V., Mamatov F.M., Alekseevich L.N., Ismailov I.I., Gulomov L.Kh. // Official newsletter. - 2021.

[3.] F.M.Mamatov AGRICULTURAL MACHINES T "Voris-Nashriyot" 2014.

[4.] Mamatov F., Chuyanov D., Ravshanov H., Shodmonov G., Tavashov R., Fayzullayev X. Combined machine for preparing soil for cropping of melonsand gourds// IOP Conf. Series: Earth and Environmental Science 403(2019) 012158

[5.] Irgashev D.B., Tovashov R.X., Sadikov A.R, Mamadiyorov O.T. Technical Analysis of Plug Software When Working Between Gardens // International Journal of Advanced Research in Science, Engineering and Technology. – Vol. 9, – Issue 5, 2022.

[6.] Mamatov F.M., Fayzullayev X.A., Irgashev D.B., Mustapaqulov S.U., Nurmanova M.S Basing the longitudinal distance between the pit softeners of the combined machine.// Innovative technologies Special issue, 2021. – B. 125-129.