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SUSTAINABLE CULTIVATION TECHNOLOGIES WITHIN AN ORGANIC FARM IN ARAD COUNTY

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Abstract. Ecological agriculture has an important role in preserving soil fertility due to the use of organic fertilizers instead of chemical ones. Organic fertilizers contribute to increasing soil fertility by increasing the content of nutrients; correction of the aerohydric regime in the soil, the intensification of microbiological activity as well as the improvement of the soil structure. The leguminous plants have the ability to ensure their nitrogen requirements through this symbiosis, and after their harvest, an appreciable amount of nitrogen remains in the soil. Within the cultural technologies, soil works represent an important link. In order to correct the aerohydric regime, a scarification was performed and the preparation of the germinal bed was carried out by a passage with a heavy disc. Before sowing, a pass is made with the combinator with the arrow blade (goose paw) with an important role in combating weeds. Vegetable remains are chopped and incorporated into the soil, leading to an increase in the content of organic matter, having an important role in the synthesis of the organic compounds that make up the humus. The degree of weeding is a problem in wheat cultivation in the ecological system, it can lead to high harvest losses of up to 60%. Optimum density, crop rotation, blind seeding, are the main factors to consider in reducing the degree of weeding

• Introduction

The use of ecological methods to restore soil fertility leads over time to an improvement of the physical chemical characteristics of the soil (humus content, pH, aerohydric regime, etc.).
Among the objectives of the European Union regarding the achievement of good soil health, in the medium term until 2030, we mention the reduction of nutrient losses by at least 50%, the general level of use and risk of chemical pesticides by 50% and the use of 50% more dangerous pesticides by 2030
Soil is home to over 25% of all biodiversity on the planet and is at the base of the food chains that feed humanity and, above all, biodiversity

• Material and method

Agrochemical mapping works were carried out on the perimeter of the holding in order to evaluate the pedo-agrochemical conditions
They were introduced into cultivationyear, wheat, sunflower and soybeans were sown in an ecological system
In order to correct the aerohydric regime, a scarification was performed and the preparation of the germinal bed was carried out by a passage with a heavy disc. Before sowing, a pass is made with the combinator with the arrow blade (goose paw) with an important role in combating weeds
The degree of weeding is a problem in wheat cultivation in the ecological system, it can lead to high harvest losses of up to 60%. Optimum density, crop rotation, blind seeding, are the main factors to consider in reducing the degree of weeding
Soil fertility is also done by introducing a leguminous crop in rotation. In the first year after the legumes, the wheat crop is established because it has high requirements for nutritional resources
Vegetable remains are chopped and incorporated into the soil, leading to an increase in the content of organic matter, having an important role in the synthesis of the organic compounds that make up the humus

Conclusions

Following the interpretation of the data, ameliorative measures were established to correct some limiting factors of soil fertility through fertilization, works to correct the aerohydric regime and correct soil acidity.
The production capacity of an agricultural holding depends decisively on a correctly planned and consistently executed rotation.
By using ecological methods to restore soil fertility, the plants contain a smaller amount of nitrates, compared to those where chemical fertilizers with nitrogen were used, which gives a superior biological quality

• Results and discussions

The studies were conducted at an organic farm located within the territory of the Vasile Goldiș locality, in Arad County.The soil types developed on a sedimentary lithological substrate consisting of gravel, sand, and clay, under a climate characterized by moderate temperature and precipitation regimes. The predominantly forest-based vegetation in the area has led primarily to the formation of brown forest soils, the evolution of which has been influenced by long-term human activity.

The lands in the northeastern part of the locality are covered by well-drained, sandy-loam brown soils, a condition resulting from a deep water table. These areas represent the oldest and most productive agricultural land in the locality.The soils in the southwestern part of the locality have developed under conditions of poor drainage; in certain limited areas, they exhibit processes of waterlogging (*lăcoviștire*) and gleying, sustained by an excess of moisture characteristic of periods with peak precipitation.The limiting factors in this area include:- excess moisture (from both the water table and surface water);- the degree of soil compaction;- a deficiency in nutrients;- the phenomenon of acidification.

Analiza solului			
pH	IN %	P ppm	K ppm
5.87	2.6	28.3	143
6.52	2.55	21.3	122
6.6	2.65	21	94
6.4	2.6	28.2	97
6.2	1.96	9.4	103.5
6.5	2.92	15.8	101.6
6.5	2.31	9.55	105.2
6.5	2.71	14.95	108
6.5	2.62	15.05	108.7
6.5	2.8	14.85	123.6
6.2	2.2	25.1	124.3

Soil pH values range from 5.87 to 6.60, indicating a variation between slightly acidic conditions in most soils and moderately acidic conditions in some plots.Phosphorus levels are low to moderate.Water-holding capacity is high; however, in recent years, long periods without precipitation have led to water stress.

A major importance is the controlled application of nutrients, in such a way as to ensure the optimal use by the crop plants of the nutrients existing in the soil and of those applied annually in accordance with the needs and requirements imposed for the protection of water and soil quality
The productivity of the land is decisively influenced by a correct rotation. The ratio between the crops indicates the way of using the land, the arrangement of the crops on the land within a year.
Soil fertility is also done by introducing a leguminous crop in rotation. In the first year after the legumes, the wheat crop is established because it has high requirements for nutritional resources
Poultry manure with straw was administered with a content of 410 mg/kg NO3, 770 mg/kg NH4, 42 mg/kg P and 7300 mg/kg K,
Soy, as the preceding plant, has an important role in preserving soil fertility because it leaves up to 120 kg/ha in the soil, leading to a significant decrease in energy costs for the next crop
For wheat, the average production in the ecological system is 2900 kg/ha with a protein content of 11-13% and hectoliter mass up to 85 .
Vegetable remains are chopped and incorporated into the soil, leading to an increase in the content of organic matter, having an important role in the synthesis of the organic compounds that make up the humus
The degree of weeding is a problem in wheat cultivation in the ecological system, it can lead to high harvest losses of up to 60%. Optimum density, crop rotation, blind seeding, are the main factors to consider in reducing the degree of weeding
An average production of 1,500 kg/ha was obtained for soybeans