DESIGNING A SPECIALIZED AGRICULTURAL SYSTEM IN THE TOWN OF OHABA LUNGĂ – BLACKBERRY CULTIVATION

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Abstract: *The specialized farming system designed is the cultivation of the blackberry. The design of the system includes land preparation works, crop-building works, works related to the installation of the support system, maintenance works. Expenses were made for all these works or overa period of three years. The blackberry is a perennial shrub that is grown for its fruits that can be eaten in different forms, fresh or processed. They have a risky content of vitamin C and A, organic acids, mineral salts and anthocyanic pigment. The location where the plantation is set up is Ohaba Lungă commune, which is located in the northeastern part of Timis County, on County Road 609. The commune is 35 km away from the town of Faget, 45 km from the city of Lugoj and 88 km from the city of Timisoara, and covers an area of 18,479 ha.*

INTRODUCTION

Agricultural system means the complex of natural and anthropogenic factors that contribute to the natural development of the agricultural production process. Agricultural systems have evolved together with the development of the agricultural production process, the evolution of science and technology, population multiplication and the change in social economic relations. [1,4,10]

From a practical point of view, the agricultural system is an ensemble of ecological, economic and social components in interaction, created by man in order to obtain vegetal and animal agricultural products, necessary to meet the needs of humans: food, clothing, shelter and culture.

Specialized agricultural systems are characterized by the fact that their activity is aimed at obtaining a single product or type of agricultural product, or at carrying out certain agricultural services. [3,5]

Ohaba Lunga has an area of 10,478.82 ha, of which 4950.37 ha of agricultural land.

The agricultural land consists of 2,208.54 ha of arable land, 1,947.64 of pastures, 737.00 ha of meadows and 57.19 hectares of vineyards and orchards. [2,6,7]

The non-agricultural land with an area of 5,528.45 ha, comprises 4,950.37ha of forests.

The relief is specific to the contact area of the hills with the mountain area. It is part of Lipovei Hills, which appear as a flat plateau, slightly asymmetrical, located at the foot of the Poiana Ruscăi mountain, a formation bordered by the Mureş Valley in the north, the Bega and Timiş rivers in the east respectively south, with an altitude ranging from 125 to 280 meters. The average altitude is 220 m above sea level. The dense valley network has greatly fragmented the peaks, giving the area a great energy of relief. The transition from the hills to the meadow is done suddenly, taking the form of strips in the direction of the Minis, Cladova, Pădurani, Topla and Ierşnic valleys that, with the exception of the very dry years, have permanent water.

The soil cover shows a great variety due to the strong relief fragmentation, each of its forms being specific to some pedogenetic processes, which determines the existence of different soil types.

The fertile land in lower areas resulting from deforestation is of the IIIrd - IVth category of fertility.

The soils on the territory of Ohaba Long were formed under the conditions of the forests in the plateau area, which through deforestation became pastureland and arable land. They mostly belong to the brown soils category. Their fertility ranges between 2.00 and 4.00 (average fertility rate is 3.5). Given the slope configuration of the land, it is necessary to reconsider the actual uses of the arable land and to keep it under strictly necessary limits, avoiding their degradation by rainfall erosion.

The preservation of their fertility will be reanalysed mainly with the intake of natural organic fertilizers.

The average annual temperature is 10.6 ° C (Lugoj station), and the annual amplitude resulting from the difference between the hottest and the coldest month temperatures exceeds 22 ° C, which explains the excessive nature of the climate. [8,9]

The average rainfall value is 725.9 mm (the Ezeriș pluviometry point located in the plateau area). It would meet the growing and developing requirements of the cultivated plants if the uneven distribution during the year would not cause a deficit of humidity during certain periods. By appropriate agro-technical measures (storage and evacuation of excess humidity), deviations can be corrected, ensuring the necessary conditions according to the requirements of the plants.

MATERIALS AND METHODS

The cultivated blackberry variety is Thornfree, which is a thorn-free blackberry, resistant to most diseases, but in some years, it is sensitive to rust by staining of the bark. This variety has great productivity potential. The fruits are of medium to large size, growing on average 6 grams, are conically elongated, brilliant black colour, acidic-sweet and very intensely coloured. The variety reaches maturity at the end of August and ends at the arrival of the frost.

Required works and calculations for a blackberry plantation:

For the establishment of a specialized system, the following types of works are generally required: land selection, preparation before planting, setting planting distances according to crop systems, choice of varieties and planting itself.

The study is being pursued during three agricultural years regarding the economic calculation of the establishment and care of the crops.

Once the land has been chosen, the works will be carried out, including:

- Land preparation works;
- Works for the establishment of the blackberry plantation;
- Installing the crop support system;
- Maintenance works during the three years.

The cultivated area was a total of 70 ares = 7000 m2

RESULTS AND DISCUSSIONS

Several types of works are being made for the establishment of a blackberry plantation. First, they start with the land selection that must have the best slopes and mood for the sun. Once the land is chosen, we begin all the establishment works for the blackberry plantation as follows:

In the first year the following works took place:

1.Land preparation:

- autumn ploughing 25-30 cm,
- 1 disc
- rotating harrow

Before ploughing, we used about 20 tons of fertilizer.

2. The infinity of the blackberry crop:
   - took place in November;
   - for the cultivated area a number of 1,300 cuttings were needed;
   - the distance between the plants is 1.30 m, and the distance between the rows is 3 m;
   - plant depth is 25 cm.

Prior to the actual planting, the roots have been trimmed and their mulching has taken place.

3. Installing the binding system:

The chosen binding system is on the trellis. The distance between the trellises is between 5 m, and the height is 2 m. The trellises were connected together with three rows of wire, to which the blackberry strings are made.

4. Maintenance works
   - the blackberry strings were connected in spring;

A) Economic calculation for year I:

Table 1.

Economic calculation for year I

Works		Costs
Land preparation:		500 lei
Infinity of the blackberry crop :		6500 lei
Installing the binding system:		1100 lei
Maintenance works		350 lei
Of which:	watering	150 lei
	binding	200 lei
Total		**8.450 lei**

1. land preparation:
- mobilizing the soil around the cuttings

2. Establishment of the blackberry crop: It was made in the first year

3. Installation of the binding system: It was made in year I

4. Maintenance works:
   - cuttings in the spring
   - 3 treatments against diseases and pests;
   - fertilization with urea.

B.Economic calculation for year II:

Table 2.

Economic calculation for year II

Works		Costs
Maintenance works		494 lei
Of which:	Watering	150 lei
	Fertilization	100 lei
	3-4 Treatments	244 lei
	Cuttings	-
Total		**494 lei**

1. land preparation:
   - mobilizing the soil around the cuttings
   - autumn ploughing
   - drilling.
2. Establishment of the blackberry crop: It was made in the first year
3. Installation of the binding system: It was made in year I.
4. Maintenance works:
- Cuttings in the spring
   - 3 treatments against diseases and pests;
   - fertilization with urea

C) Economic calculation for year III:

Table3.

Economic calculation for year III

Works		Costs
Land preparation		600 lei
Maintenance works		494 lei
Of which	Watering	150 lei
	Fertilization	100 lei
	Treatments	244 lei
	cuttings	-
Total		**1.094 lei**

The blackberry crop has fruit in year 3, so this year we have obtained a yield of 180 kg. It is harvested from the end of July to the beginning of September. The plant variety is Thornfree.

Table 4.

Calculation of yield in year III

Crop	Yield	Price
Thornfree variety	180 kg	15 lei /kg
TOTAL	**2.700 lei**	

Total costs	Lei
Year I	8.450 lei
Year II	494 lei
Year III	1.094 lei
Total	**10.038 lei**
Total income from sales	**2.700 lei**

Next spring, we intend to set up a dripping watering system and the sowing of clover between the rows of blackberry. The necessary costs are shown below.

Table 5

Required materials and costs for installing the dripping system

Required materials	Costs
-water absorption pipeline	150 lei
-power pump	677 lei
-3 filters	90 lei
-main pipeline (40 m)	80 lei
-secondary pipelines with drips: 22 rolls 1 roll=94 lei (100 m)	2.068 lei
Total	**3.065 lei**

Table 6

The cost of sowing clover among the rows of blackberry

Costs needed for sowing the clover		
Seed		300 lei
Seeding works		350 lei
Of which:	- Ploughing	150 lei
	- Preparation of the germination bed	100 lei
	- Sowing	100 lei
Cutting works – 3 harvesters		lei
TOTAL		**800 lei**

CONCLUSIONS

- The biggest expenses occurred in the first year due to the costs of setting up the crop at a cost of 8.450 lei. In the second year the total costs are 494 lei, and in the third year 1,094 lei.
- The blackberry crop is not pretentious and does not require a great financial effort.
- The blackberry crop is profitable, with high yields of 15 t/ha.
- It is a crop that can be easily processed, thus increasing the value of the product.
- To improve the system as a plan, we would like to install a dripping watering system and to sow clover among the blackberry rows. The costs of the dripping watering system are 3.065 lei, and the ones for the clover sowing are 800 lei.
- Expenses damping will be made within at least 3 years after the start of production, as production will increase compared to the first year of harvest by a minimum of 25%, so the income will be higher.

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