

STUDY ON THE PERCEPTION OF ROMANIAN FARMERS REGARDING THE FACTORS THAT INFLUENCE THE DEVELOPMENT OF AGRICULTURE

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Abstract

Climate changes with their effects: floods, drought, desertification affect agricultural production. Likewise, the Agricultural Policies on the European Union, through the Farm to Fork Strategy, propose limiting the amount of fertilizers to improve the quality of the environment. Farmers must adapt and use high-performance technologies to face these challenges. In this context, the study analyses the perception of farmers with large farms regarding the main factors that influence the evolution of agriculture in Romania. According to the survey, the factors that influence the increase in agricultural production are: the use of selected seeds, adapted to the agricultural area where the farm operates, the establishment/expansion of irrigation systems, access to new research in the agricultural field, the increase in the level of training of agricultural personnel, the intensive application of fertilizers and pesticides, easy access to low- cost financing. Regarding the association in agriculture and ecological agriculture adapted to climate change, the farmers' attitude is polarized.

Key words: climate changes, certified seeds, genetic breeding techniques, irrigation systems, Romania

INTRODUCTION

The effects produced by climate change: drought, floods, desertification affect the agricultural activity [10].

The new CAP reform is based on Green Deal sustaining production, renewable energy resources, protecting environment and biodiversity assuring food security and safety [1].

Romania will implement the Agricultural Policy of the European Union, including the Farm to Fork Strategy, in order to reduce the amount of fertilizers and improve the quality of the environment [6, 4, 5]. The increase of energy and diesel prices will influence the efficiency of farmers' activity.

Adapting to these changes is essential for the survival of Romanian farms and ensuring food security [9].

Agricultural technologies are a main factor of influence on the agricultural performance [3, 2] and farmers' training level as well [8].

From this perspective, the study aims to highlight the factors that influence the evolution of agriculture in Romania, the perception of farmers regarding new agricultural technologies

MATERIALS AND METHODS

The questionnaire was addressed to producers of cereals, technical plants and oil seeds in Romania and analyzed the perception of farmers with large farms regarding the main factors that influence the evolution of agriculture at the level of large agricultural holdings that grow wheat, corn, barley, sunflower, rapeseed, soybeans and potatoes.

The content of the questionnaire aims to analyze the farmers' answers regarding the following indicators: the importance of the criteria by which farmers select their input suppliers, the limiting factors that can contribute to the decrease in production, the factors that can lead to the increase in

productivity, the new improvement techniques based on high-performance technologies, the farmers opinions regarding the Farm to Fork Strategy [7].

The questionnaire was sent and completed by the farmers. The collected information was processed with the SPSS (Statistical Package for the Social Science) application, using the relative frequency of the analyzed indicators as a method.

The research was carried out between February and March 2022, on the number of 29 large and very large agricultural holdings in Romania. The holdings are part of the following counties: Giurgiu, Prahova, Constanta, Braila, Calarasi, Dolj, Ilfov, Tulcea, Olt, Arges, Vrancea and Ilfov.

Regarding the structure of the existing areas in operation by the responding agricultural producers, the situation is as follows: 17.2% of the holdings have an area of less than 200 hectares, 34.5% of the holdings have an area between 201 hectares and 500 hectares, 27.6 % of the holdings have an area between 501 hectares and 1,000 hectares, 17.2% of the holdings have an area between 1,001 hectares and 2,100 hectares and 3.4% of the holdings have an area between 2,101 hectares and 55,638 hectares.

RESULTS AND DISCUSSIONS

1. Criteria for selecting input providers

Proper selection of the input supplier is essential in increasing the productivity and competitiveness of the farm. According to the answers, an essential role in the selection of input suppliers is played by the history of seriousness between supplier and farmer (62%). Another essential criteria is the quality of inputs, adaption to the nutritional needs of the soil (58%).

The third essential element is related to the commercial aspects of the supplier-customer relationship: commercial discounts, promptness of deliveries, on the appearance of contracts.

Valuing social trust, based on the direct relationship between supplier and farmer, plays an important role in the selection process (Fig. 1) [11].

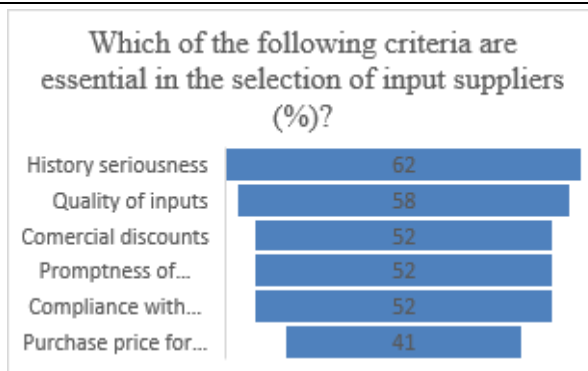


Fig. 1. Selection criteria of input suppliers
 Source: Created by authors based on own data.

2. Limiting factors that can contribute to the decrease in production

In order to identify the importance of limiting factors on agricultural production, the following were studied: climate change, lack of funding, drought, lack of skilled labor force, too heavy rainfall/puddles, desertification of land, lack of access to innovative technology or heavy access, treatments with fertilizers and pesticides underutilized, access to new agricultural research.

Thus, the farmers' replies highlighted the following:

Climate change is considered very important (69%) and important (20.7%) respectively as a limiting factor and with an impact in decreasing agricultural production (Fig. 2).

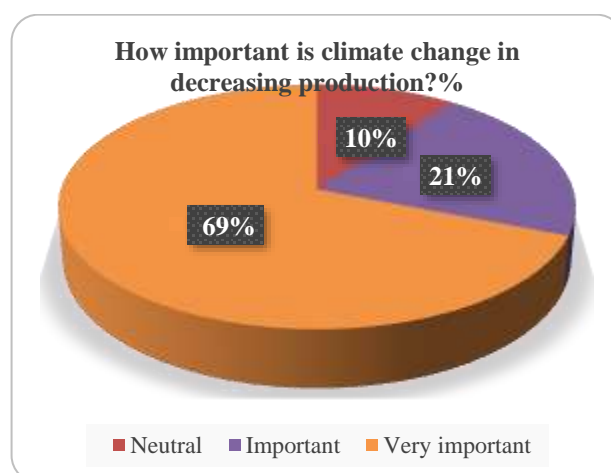


Fig. 2 Factor –Climate change
 Source: Created by authors based on own data.

Drought contributes dramatically to the decrease in production and is considered very important (96.6%) by farmers (Fig. 3).

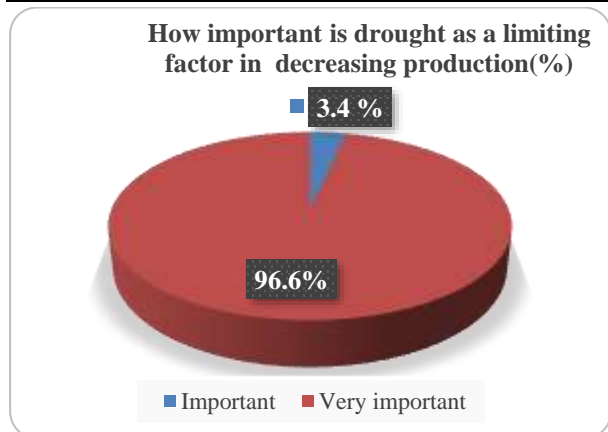


Fig. 3. Factor- Drought
 Source: Created by authors based on own data.

The lack of funding is perceived as the least important factor for the decrease in production of 45% of farmers. At the opposite pole, 17% of them consider the lack of funding a very important limiting factor in the decrease in production (Fig. 4).

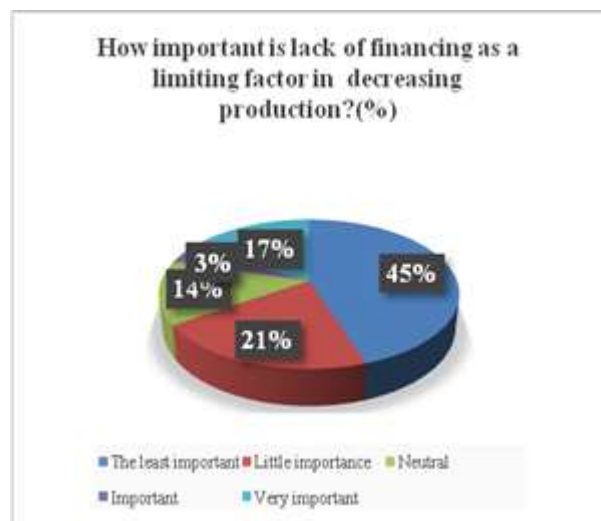


Fig. 4 Factor – Lack of funding
 Source: Created by authors based on own data

The lack of skilled labour is perceived as a neutral factor in obtaining production by 27.6% of farmers. On the other hand, 20.7% of farmers consider it very important, while 24.1% of them think it is the least important (Fig. 5).

Lack of access to innovative technology or heavy access is considered a neutral factor by 28% of farmers.

On the one hand, the lack of access is the least important for 31% of farmers, while for 21%

it is important for the decrease in production (Fig. 6).

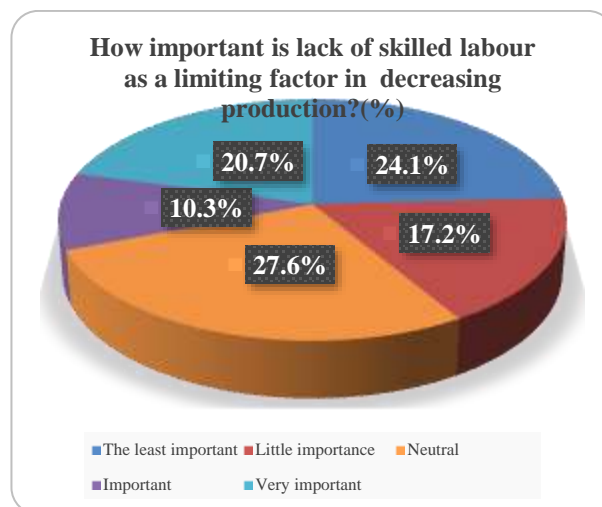


Fig. 5. Factor –Lack of skilled labour
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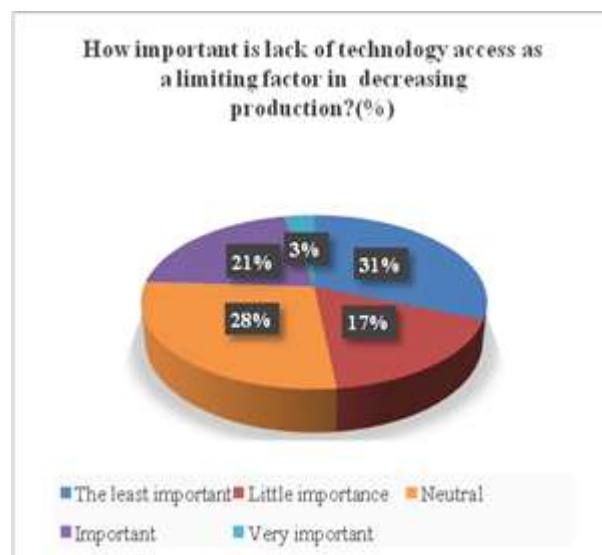


Fig. 6. Factor – Lack of technology access
 Source: Created by authors based on own data

The above-average heavy rainfall/pond are considered the least important by 31% of farmers in decreasing production, while 24% consider them very important (Fig. 7).

The desertification of the land is considered the least important (34%) and, respectively, the least important (21%) in the decrease in production, on the background that this phenomenon manifests itself on a small scale at the level of Romania.

However, 14% of farmers consider it important and 7% very important with drastic consequences for production (Fig. 8).

Treatments with too little-used fertilizers and pesticides are considered a neutral factor for 21% of farmers.

On the other hand, 27% of farmers consider them to be the least important and 17% to be of little importance, while 21% of farmers consider them important and for 14% of them they are very important in decreasing production (Fig. 9).

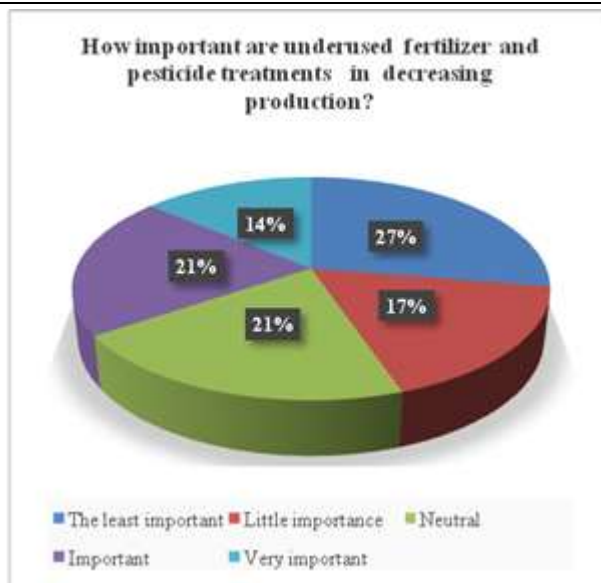


Fig. 9. Factor –Treatments with few fertilizers
 Source: Created by authors based on own data

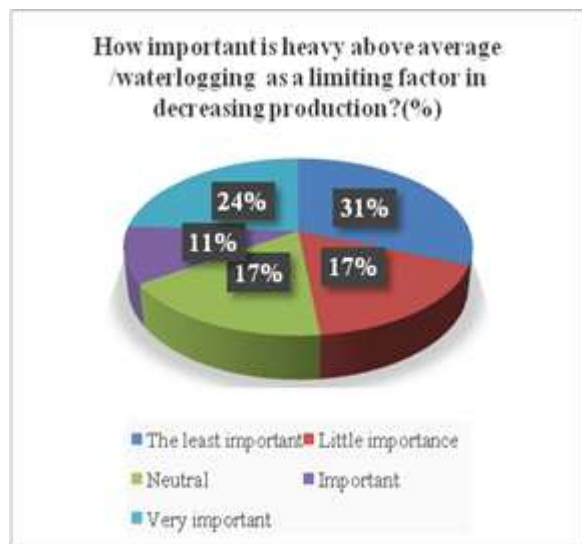


Fig. 7. Factor –Heavy rainfall
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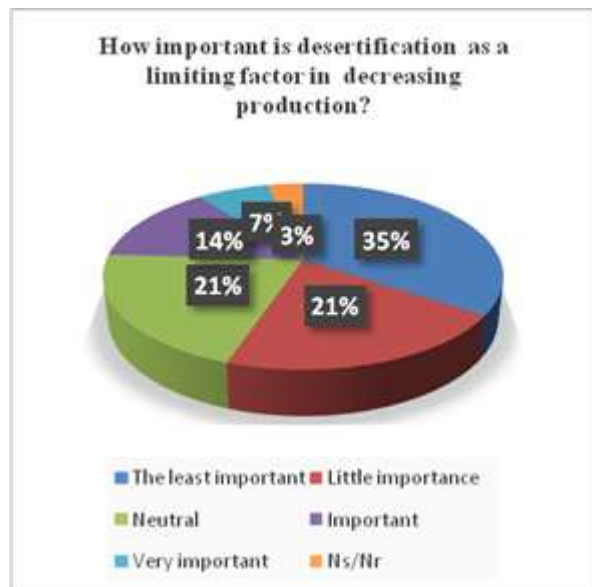


Fig. 8. Factor –Desertification
 Source: Created by authors based on own data.

3. Factors that can contribute to the increase of agricultural production

In order to identify the instruments by which agricultural producers can be supported in the successful achievement of sufficient agricultural production and of good organoleptic quality, farmers' responses on this issue were analyzed taking into account the following aspects:

- access to new agricultural research,
- the level of training of the personal,
- easy access to low-cost finance,
- establishment/extension of irrigation systems,
- the use of selected seeds adapted to the agricultural area in which the agricultural holding operates,
- the intensive application of fertilizers and pesticides,
- climate-friendly organic farming and the association in agriculture.

Thus, in terms of **access to new research in the agricultural field**, it is considered important (27.6%) and very important (48.3%) by farmers in order to increase agricultural production (Fig. 10).

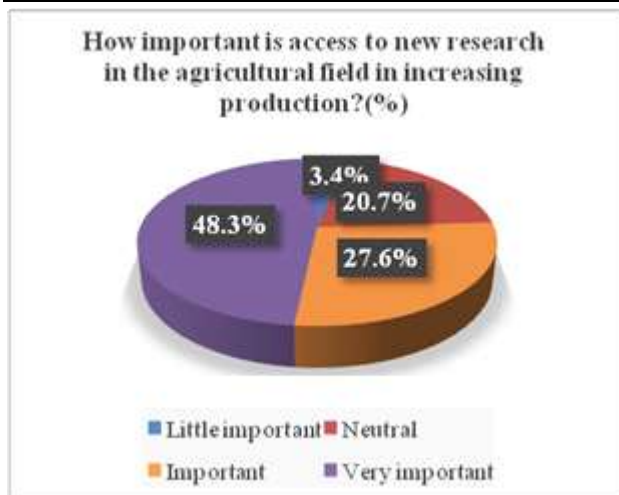


Fig. 10. Factor – Access to new researches
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Increasing the level of training of agricultural staff is considered a very important condition for 38% of farmers, respectively important for 21% of them in order to obtain a better production (Fig. 11).

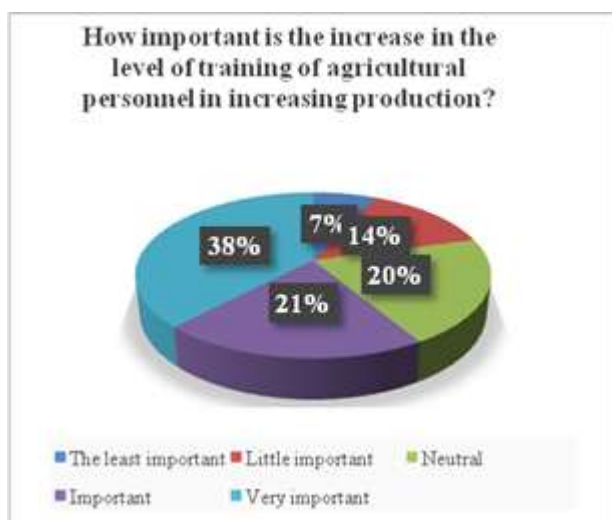


Fig. 11. Factor – Increase level of training
 Source: Created by authors based on own data.

Easy access to low-cost financing is considered a neutral factor for 44.8% of farmers. On the other hand, 27.6% consider it very important, respectively 13.8% important in order to increase production (Fig. 12).

The establishment/extension of irrigation systems is considered a very important condition for 51.7% of farmers in order to increase agricultural production (Fig. 13).

The use of selected seeds, adapted to the agricultural area where the agricultural holding

operates, is considered very important for 69% of farmers in order to obtain a better yield (Fig. 14).



Fig. 12. Factor – Easy access to financing
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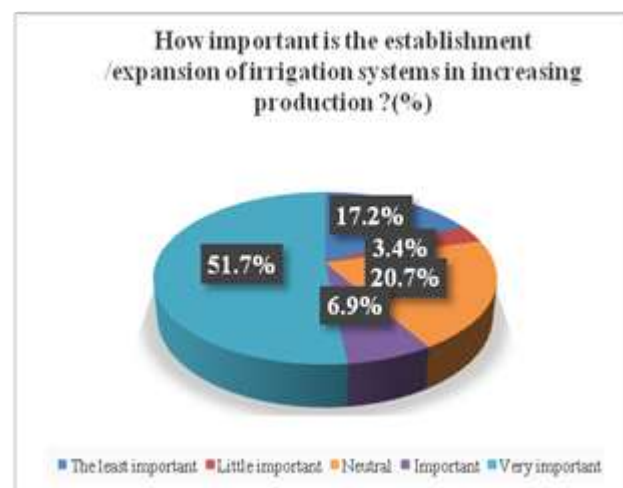


Fig. 13. Factor – Irrigation systems
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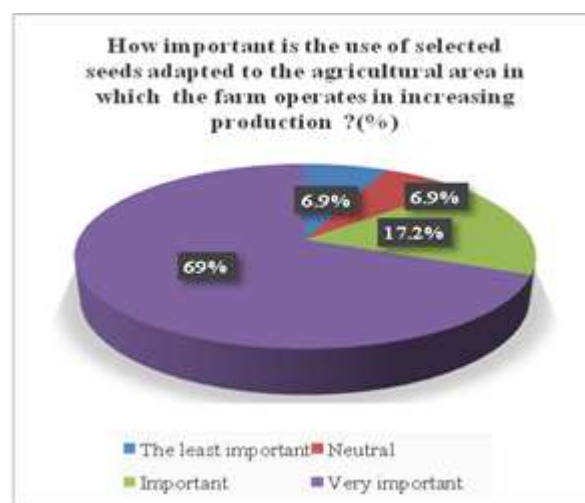


Fig. 14. Factor – Certified seeds
 Source: Created by authors based on own data.

The intensive application of fertilizers and pesticides is considered very important (34.5%) and important (24.1%) respectively for increasing agricultural production (Fig. 15).

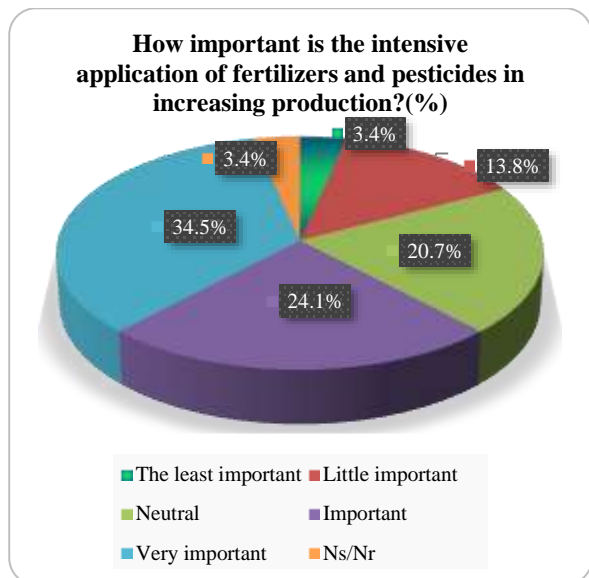


Fig. 15. Factor – Intensive application of treatments
 Source: Created by authors based on own data.

Ecological agriculture adapted to climate change is considered the least important by 34.5% of farmers, respectively less important by 17.2% of them in increasing production. Moreover, 27.6% of farmers have a neutral position regarding the practice of ecological agriculture adapted to climate change (Fig. 16).

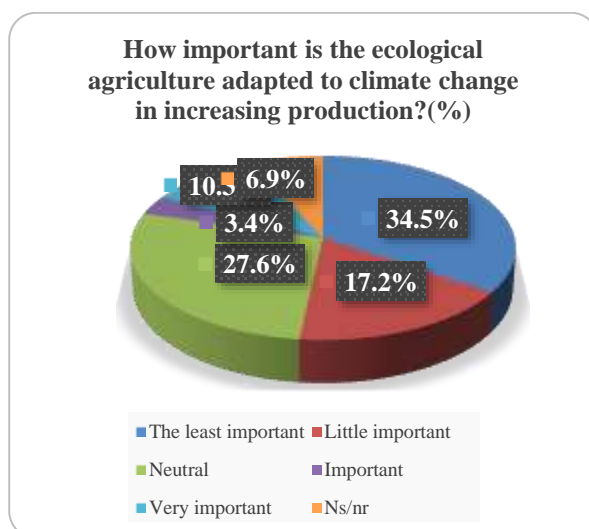


Fig. 16. Factor – Ecological agriculture
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Compared to the association in agriculture, the attitude of farmers is polarized: 20.7% have a neutral attitude, 24.1% consider it important, 24.1% think it is very important, 17.1% consider it less important for increasing production (Fig. 17).

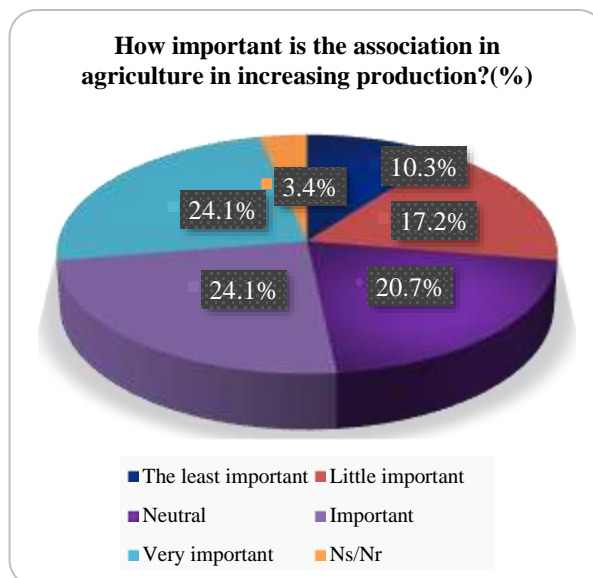


Fig. 17. Factor – Association in agriculture
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4. New breeding techniques based on high-performance technologies

Innovative technologies such as precision agriculture, digitization, genetic improvement techniques, certified seeds, the use of robots, drones as well as GPS, was the topic addressed in the questionnaire and to which farmers have the following perceptions.

Genetic improvement techniques are perceived as very important (69%) and important (20.7%) respectively by farmers. (Fig. 18).

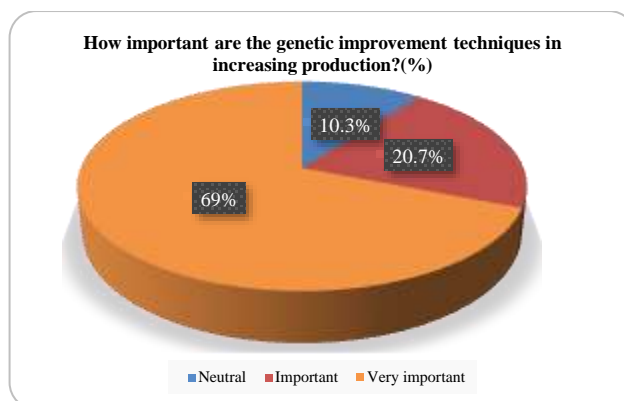


Fig. 18. Innovation – GIT
 Source: Created by authors based on own data.

Digitization is considered very important for 31% of farmers and important for 20.7% of them. Also, 27.6% have a neutral attitude towards digitization.

The use of databases containing the assessment of climate and productivity parameters allows inputs to be applied in the optimal epoch and quantity (Fig. 19).

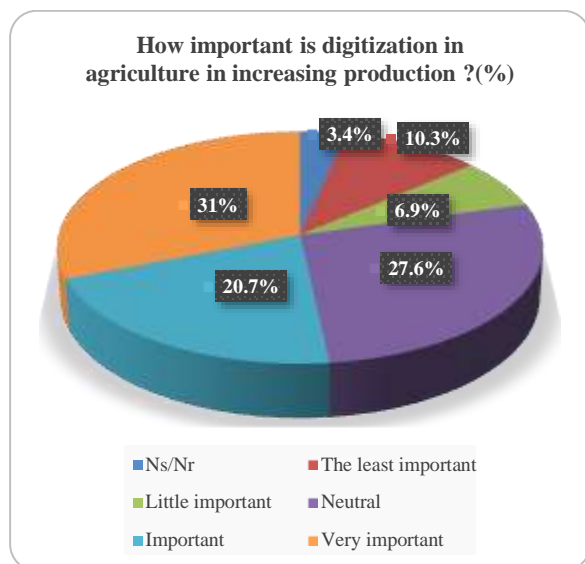


Fig. 19. Innovation– Digitization
 Source: Created by authors based on own data.

Certified seeds are a very important factor (76%) and important (17%) respectively in increasing production for farmers (Fig. 20).

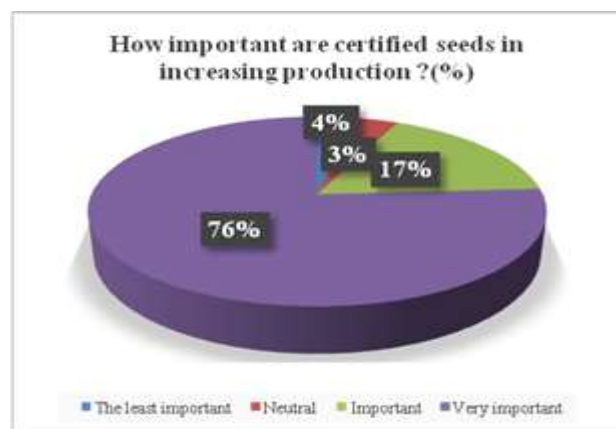


Fig. 20. Innovation Certified seed
 Source: Created by authors based on own data.

Farmers believe that the use of **robots** to increase agricultural production is the least important (31%) and the least important (20.7%). Also, an important percentage (20.7%) have a neutral attitude. The use of

robots in agriculture to obtain performance is important for 6.9% and very important for 17.2% of farmers, respectively (Fig. 21).

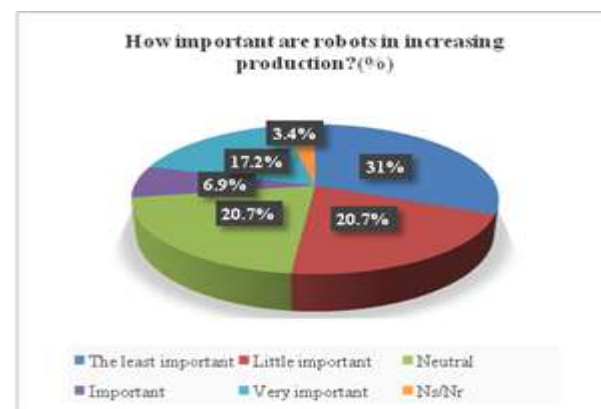


Fig. 21. Innovation – Robots
 Source: Created by authors based on own data.

For the implementation of the precision agriculture system, it is necessary to monitor the crops by using aerial images that can be taken with the help of drones. Drones can also be used for the application of inputs, which leads on the one hand to the reduction of the quantities of pesticides, and on the other hand to the optimization of the use of inputs.

The use of **drones** in agriculture is the least important factor for 27.6% of farmers. Also 27.6% of them have a neutral attitude. Achieving performance with the help of drones is important for 10.3% of farmers and, respectively, very important for 20.7% of them (Fig. 22).

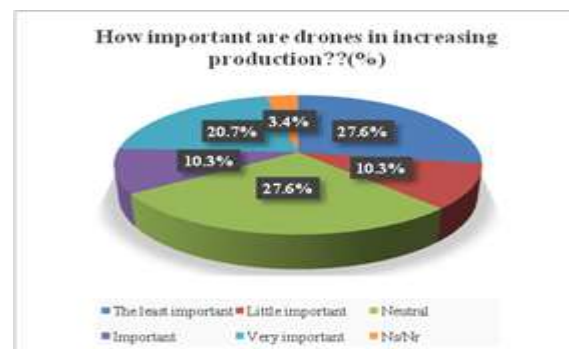


Fig. 22. Innovation – Drones
 Source: Created by authors based on own data.

The use of GPS in agriculture is considered a very important condition (65.5%) and important (17.2%) respectively for increasing production (Fig. 23).

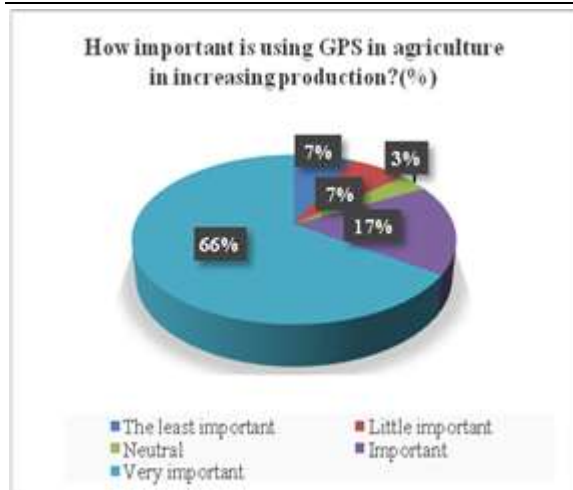


Fig. 23. Innovation – GPS
 Source: Created by authors based on own data.

5. Farmers' views on the impact of implementing the Farm to Fork Strategy

Regarding the perception of agricultural producers upon the impact of the Farm to Fork strategy on the activity of their own holdings and especially on agricultural production, the answers were different and somehow contradictory.

A part of the farmers affirmed that, although they do not use quantities of pesticides above the recommendations and permissible doses, the impact of the reduction will be harsh, with effects in increasing expenses, reducing incomes and business profitability (Fig. 24).



Fig. 24. Farmers' opinions on Farm to Fork Strategy
 Source: Created by authors based on own data.

CONCLUSIONS

Agricultural producers consider drought and climate change to be limiting factors with a direct effect on the fall in production, with disastrous consequences for agricultural activity.

The factors that lead to the increase of agricultural production are, in descending

order of importance, the following: the use of selected seeds, adapted to the agricultural area where the agricultural holding operates, the establishment / extension of irrigation systems, access to new research in the agricultural field, increasing the level of training of agricultural personnel, intensive application of fertilizers and pesticides, easy access to low-cost financing. Towards the

association in agriculture and organic agriculture adapted to climate change, the attitude of farmers is polarized.

The most important breeding techniques based on high-performance technologies are, in descending order of importance for farmers, the following: certified seeds, genetic improvement techniques, the use of GPS in agriculture and digitization. Compared to the use of robots and drones in agriculture, farmers have a polarized attitude.

Reducing the quantities of fertilizers, as stipulated by the Farm to Fork Strategy, will have a major impact on the level of agricultural productions and their quality as well as on farmers' incomes, quality of life and standard of living.

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