

STUDY REGARDING THE EVOLUTION OF HIGH-PERFORMANCE CULTIVATION TECHNOLOGIES IN GREENHOUSES AND HIGH TUNNELS IN ROMANIA

Elena Maria DRĂGHICI, Ovidiu Ionuț JERCA, Sorin Mihai CÎMPEANU, Răzvan Ionuț TEODORESCU, Jeni ȚIU, Liliana BĂDULESCU

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

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INTRODUCTION

The present study on the evolution of high-performance technologies as well as the evolution of areas with greenhouses and solariums in Romania aimed, in particular, to identify farmers who have adopted high-performance technologies in order to increase tomato production.

We identified the high-performance greenhouses in Romania, especially those that grow tomatoes in them. They also identified the areas occupied by greenhouses and high tunnels, cultivated in a soilless system, on substrates or on the ground in some areas of Romania.

MATERIALS AND METHODS

The study aimed to identify the areas occupied by greenhouses and solariums in some zones of Romania, especially in the south but also in the center of the country. Some data were taken from the County Agricultural Directorates, APIA, but also from the field analysis. We aimed to: - identify the areas and the size of the surfaces with heated and unheated protected spaces, by counties;- identification of the type of construction;- degree of technologicalization;-the cultivation system practiced conventionally or unconventional;-type of substrate used;-culture structure and culture cycle;- the productions obtained.

According to data recorded by the Research Institute for Agricultural Economics and Rural Development in 2018, the average annual consumption of tomatoes per capita was 41.4 kg. Starting from the reality that in 2019 1420 ha of protected surface (areas) were declared in Romania, in order to ensure the Romanian market with fresh vegetables, it is necessary to increase the protected surfaces areas so that according to its program it will reach in 827 to about 8-10 thousand hectares.

In Romania most greenhouses were between 4 and 7 m high (Figure 1).



Figure 1. Appearance of low greenhouses 4 m high and 7 m high in Romania (original)

Data on the situation of areas declared with protected, by farmers, and beneficiaries of payments managed by APIA (Agency for Payments and Intervention in Agriculture) show that in 2020 there were a total surfaces 2889.2 ha of which 160.76 ha in greenhouse, 1750.28 ha in high tunnels, and 978.08 ha represented other types of protected cultures. By counties the situation is presented in the figures 2, 3 and 4).

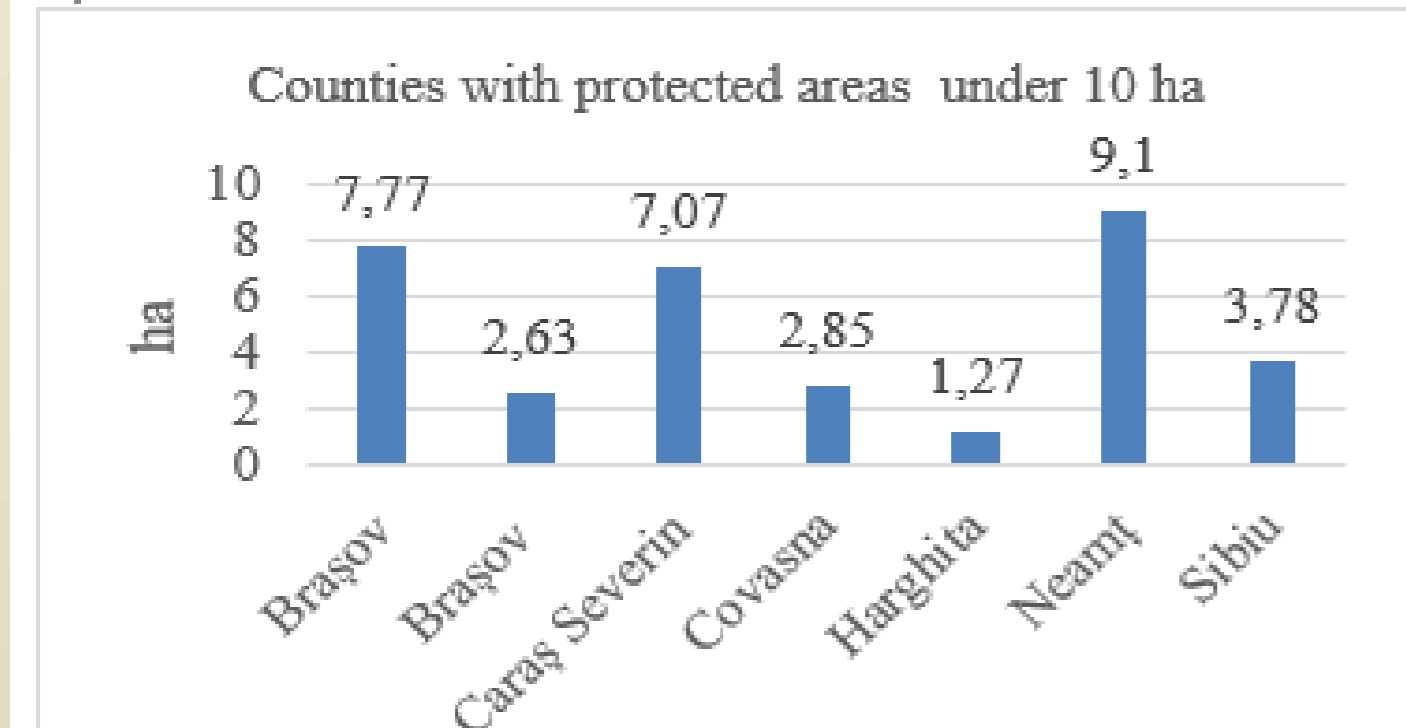


Figure 2. Counties with protected areas under 10 ha from Romania



Figure 22. Research greenhouses from SCDL Buzău (original)

RESULTS AND DISCUSSIONS

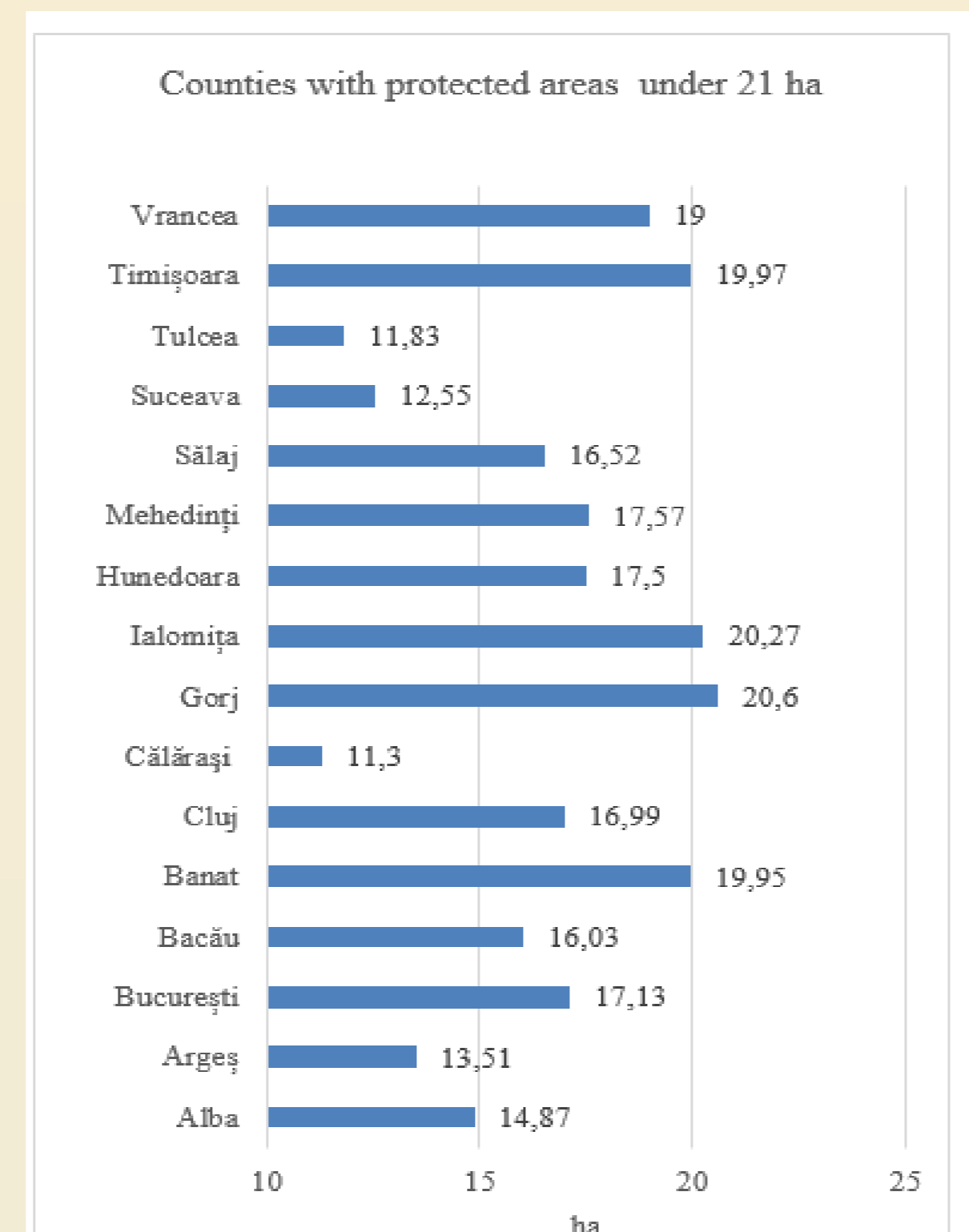


Figure 3. Counties with protected areas over 10 ha up to 21 ha in Romania

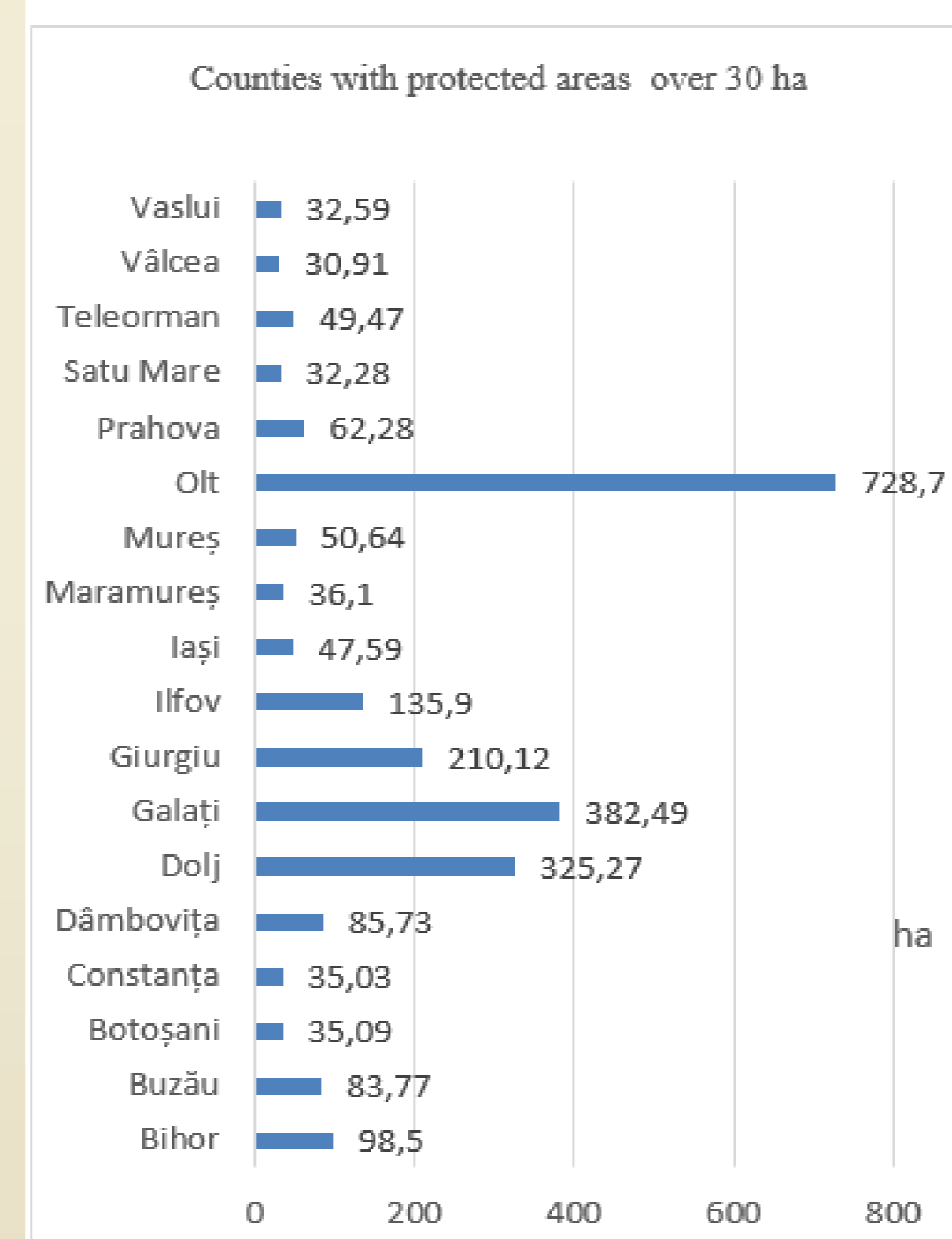


Figure 4. Counties with protected areas over 30 ha



Figure 11. Aspects from Dalin greenhouses, Mureș county (original)

The greenhouses from Mihăilești district - Oxigen Agro Product Company- from Giurgiu county are modern greenhouses, in cultivation system on coconut substrate. The obtained products have GlobalGAP certification (fig.6). As for the type of construction, they are tall greenhouses, covered with polyethylene foil.



Figure 6. Greenhouses Oxigen Agro Product Company, Mihăilești, Giurgiu county (original)



Figure 10. Appearance inside Pipera greenhouses (original)



Figure 17. Appearance of greenhouses Lolita (original)

In the study we identified a total of 29,548 ha occupied by modern greenhouses that use unconventional technology, on nutrient substrates and 11.4 ha modern greenhouses that use conventional technology, some on the ground being ecologically accredited (figure 5).

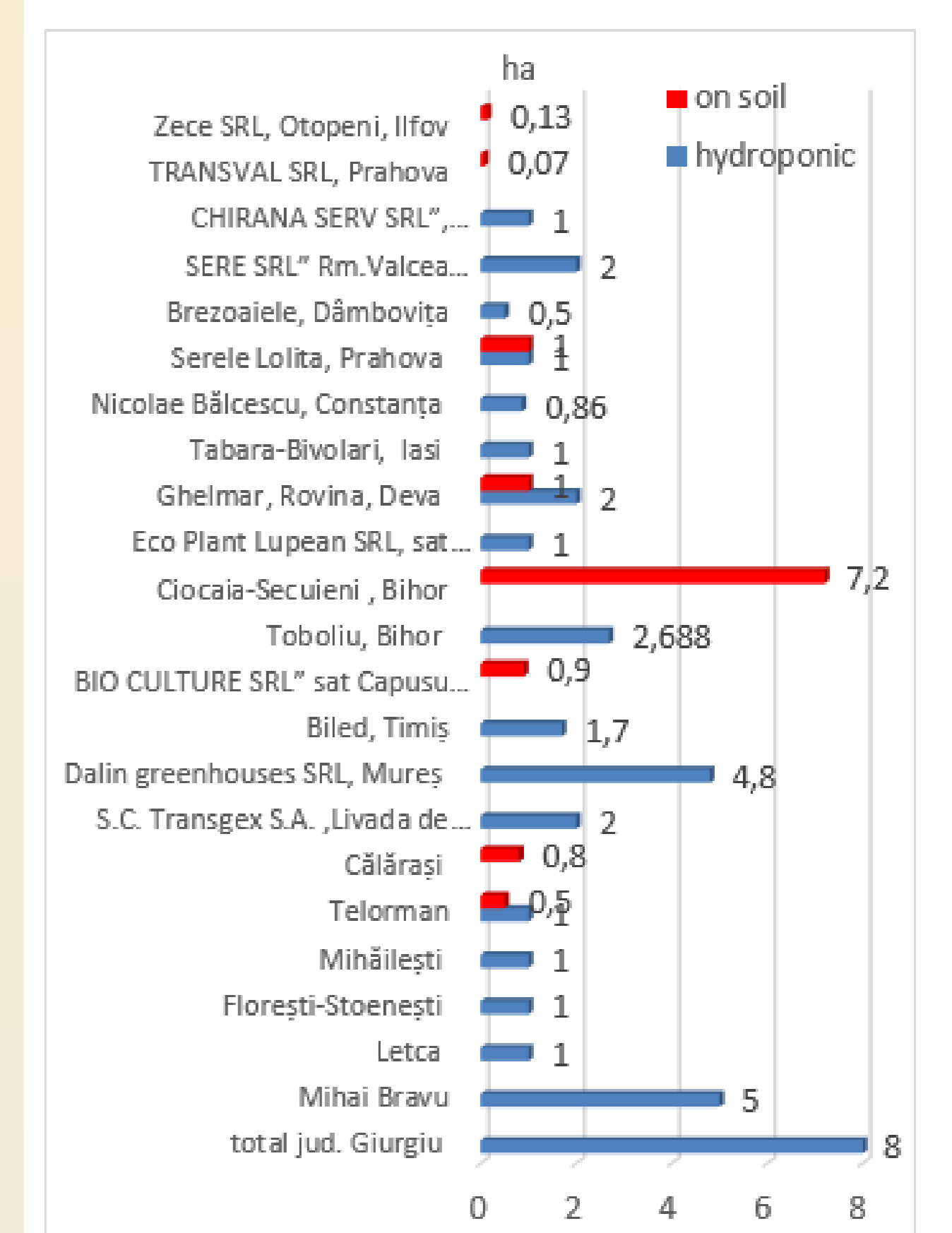


Figure 5. Situation of areas occupied by greenhouses and high tunnels, cultivated in a system without soil, on substrates, or on the ground in some areas of Romania



Figure 18 a. Appearance from the research greenhouse - tomatoes, pepper, eggplants from UASMV Bucharest

CONCLUSIONS

Modern shelters, greenhouses or high tunnels are an alternative to the constant supply of fresh vegetables. High-performance technologies demonstrate their efficiency in obtaining high yields per unit area but also by reducing the greenhouse effect. In the study I made an analysis on the evolution of protected areas over time and after 1989. I came to the conclusion that in Romania the greenhouse areas covered the country's vegetable needs while also being exported.

After 1989 the areas have decreased from one year to another so that the need for vegetables, especially tomatoes, is covered by imports. In present, a return to production is being attempted to cover consumption needs. Through the new constructions and high-performance technologies, although the areas with built greenhouses are smaller, the efficiency being much better with the productions high of over 700 t / ha.

ACKNOWLEDGEMENTS

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