Research Journal of Agricultural Science, 57 (2), 2025; ISSN: 2668-926X

http://doi.org/10.59463/RJAS.2025.2.14

TYPOLOGY OF FAMILY FARMING SYSTEMS WITHIN GHILAD COMMUNE, TIMIS COUNTY

A.OKROS, Casiana MIHUȚ, Anișoara DUMA COPCEA, Carmen Claudia DURĂU, Daniela SCEDEI, Delia JURCHIȚA

University of Life Sciences "King Mihai I" from Timișoara, 300645, Arad Way, no. 119, Romania

Corresponding author: adalbertokros@usvt.ro

Abstract: *Fragmentation of agricultural land represents a significant challenge for agriculture in Romania, with direct effects on productivity and land exploitation efficiency, thus requiring the practice of an extensive farming system and making it impossible to implement an intensive farming system. Therefore, this major division of agricultural land leads to several disadvantages such as higher costs for farmers (especially in terms of transportation, the need for a larger number of smaller machinery, and an increase in the number of employees required), limited mechanization, and inefficient distribution of fertilizers, pesticides, and irrigation water. This paper aims to analyze the degree of fragmentation of agricultural land in the Ghilad locality based on data obtained directly from local farmers as well as from my own farm. Thus, after studying the land declarations over several years between 2014-2024, from three agricultural farms in the commune, I compiled tables and graphs that summarize the collected data in order to highlight the issue faced by farmers. Therefore, I observed that the agricultural parcel areas range from a minimum of 0.25 hectares (cultivated with dry beans) to a maximum of 23.58 hectares of communal permanent pasture used individually. However, for field crops, the maximum area is 11.77 hectares.*

Keywords: *cropping system, typology, farming, soil.*

INTRODUCTION

Ghilad is a commune in Timiș County, Romania, consisting of the villages Gad and Ghilad . From the point of view of the main landform, Ghilad commune falls into the category of Plain: low plain with alluvial-proluvial deposits in the Timiș – Bega – Bârzava sector. The low plains in this floodplain sector are relatively recent, drained by rivers with a permanent regime: Bega, Timiş, Bârzava, Moravița and represent a typical Holocene digression region in which both the local and general subsidences of the lower course of the Tisza river determined the covering of the loessoid deposits and older alluvium with more recent alluvial materials, on the surface of which the soils are in reduced stages of evolution. The general inclination of the plain is from E to W from 180m to 90m (Făget-Timișoara).

The Ghilad topoclimatic type is at the interference of continental air masses, of western and eastern origin, suffering in addition to the invasion of warm, southern air masses. The frequency with which these types of air masses influence the thermal and rainfall regime gives the area a temperate climate, with a moderate degree of continentalism, with more or less accentuated sub-Mediterranean influences. The multiannual average temperature at the Timisoara station between 1887-2007 registers values of 10.9oC. The average annual temperature of the soil (5-10 cm deep) in the cold period drops below 0oC only between December 25 and January 25, when values of 2-4 oC are achieved in the air ·

http://doi.org/10.59463/RJAS.2025.2.14

MATERIAL AND METHODS

In order to find out what agricultural system is practiced in the area of Ghilad, Timiș County, we gathered information from farmers, public institutions, but also from locals.

RESULTS AND DISCUSSIONS

In the following, we will present the structure of some agricultural holdings in Ghilad commune in order to highlight the area of the plots and the structure of the crops for the period **2014 – 2024**.

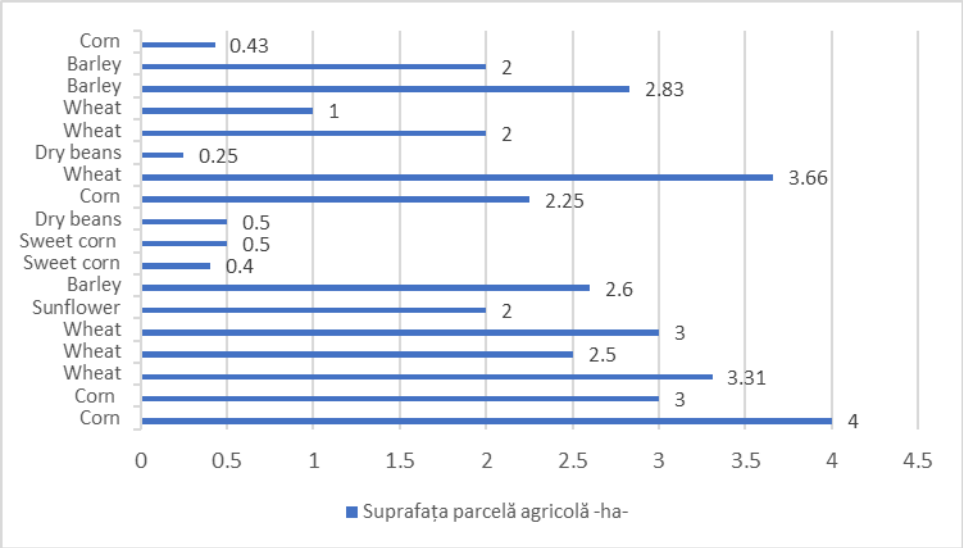

Figure 1. Area of the agricultural holding Farmer ID: RO004568707 – Year 2014

From Figure 1 it can be seen that in 2014 the predominant area of the farm was cultivated with wheat: 15.47 ha, followed by corn: 9.68 ha and barley: 7.43 ha.

http://doi.org/10.59463/RJAS.2025.2.14

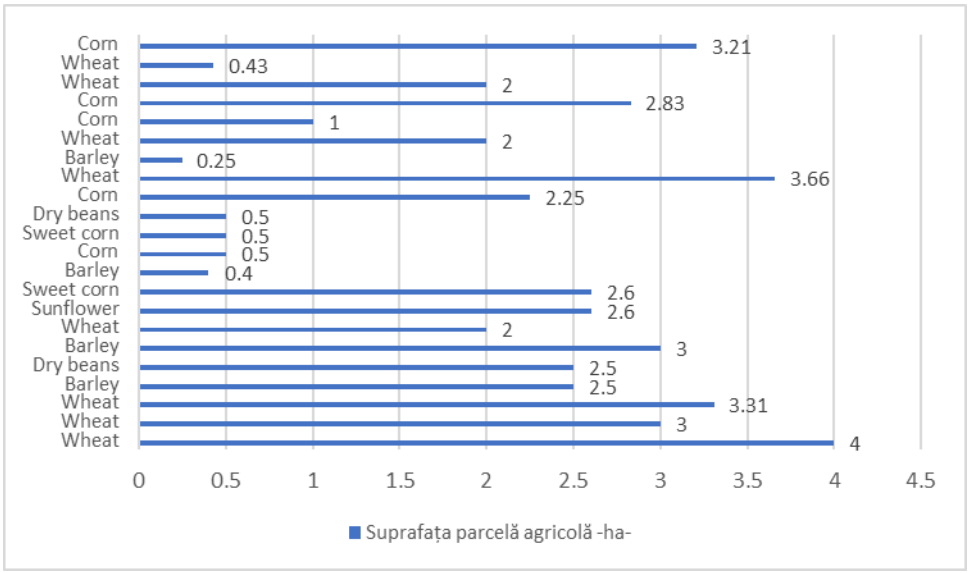

Figure 2. Area of the Farmer ID farm: RO004568707 – Year 2015

In 2015, wheat was grown on the largest wheat area: 20.4 ha, followed by corn on 9.79 ha and barley 6.15 ha.

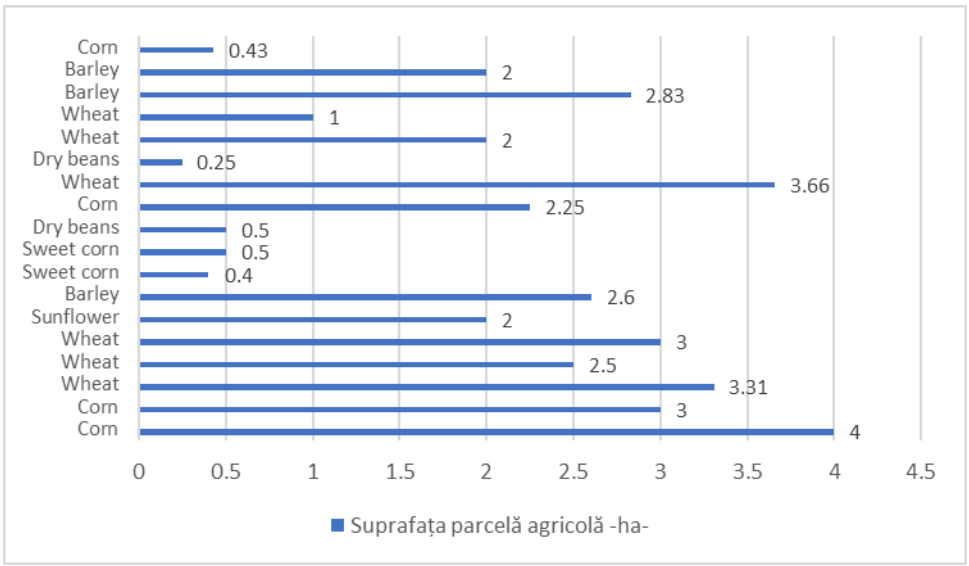

Figure 3. Area of the agricultural holding Farmer ID: RO004568707 – Year 2016

From Figure 3 it can be seen that most of the area owned in 2016 was cultivated with wheat: 15.47 ha, corn: 9.68 ha and barley: 7.43 ha.

http://doi.org/10.59463/RJAS.2025.2.14

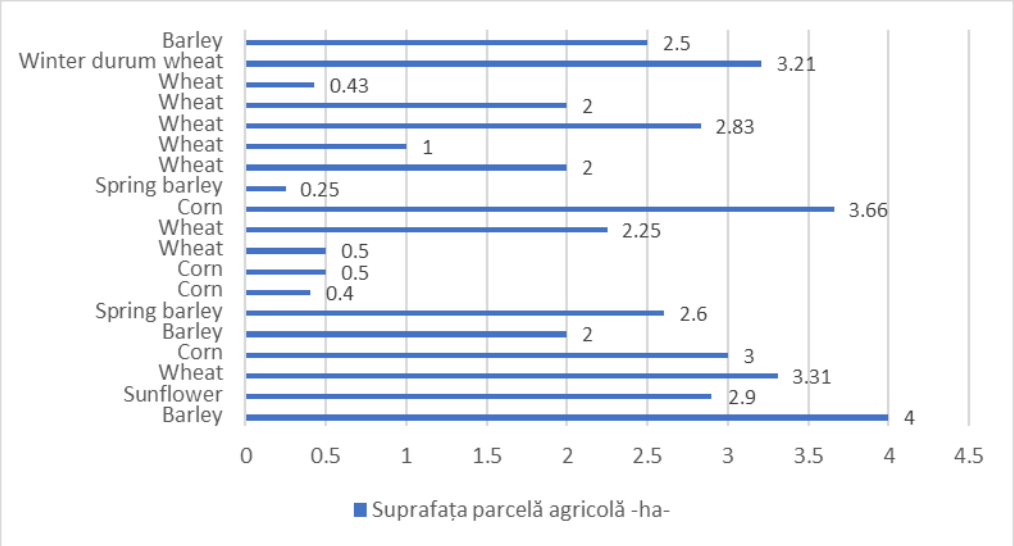

Figure 4. Area of the agricultural holding Farmer ID: RO004568707 – Year 2017

In 2017, the majority area was cultivated with wheat: 17.53 ha, barley: 8.5 ha and corn: 7.56 ha.

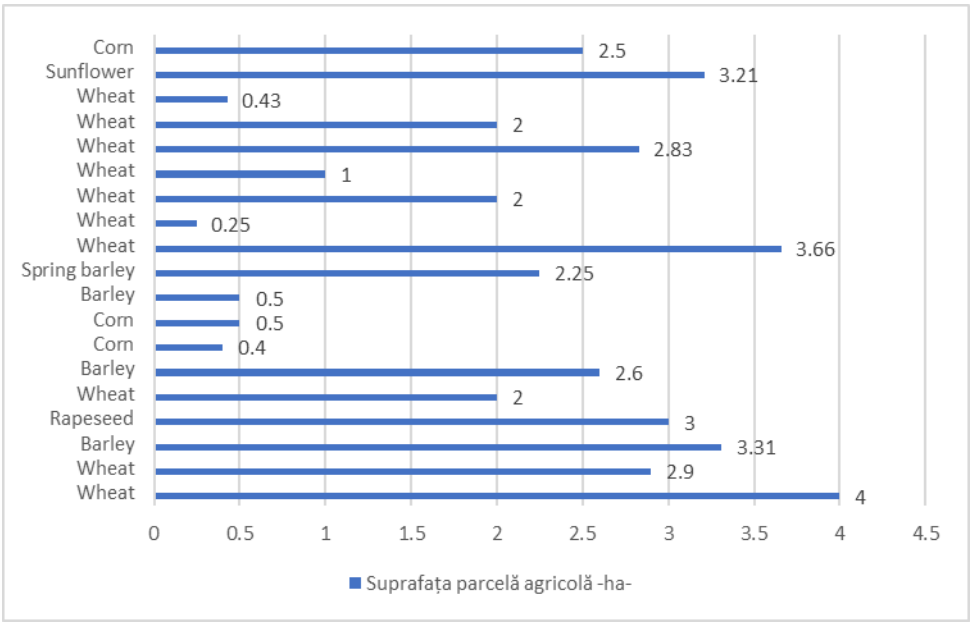

Figure 5. Area of the farm ID Farmer: RO004568707 – Year 2019

In 2019, wheat was mainly grown: 21.07 ha, barley: 6.41 ha and corn: 3.4 ha.

http://doi.org/10.59463/RJAS.2025.2.14

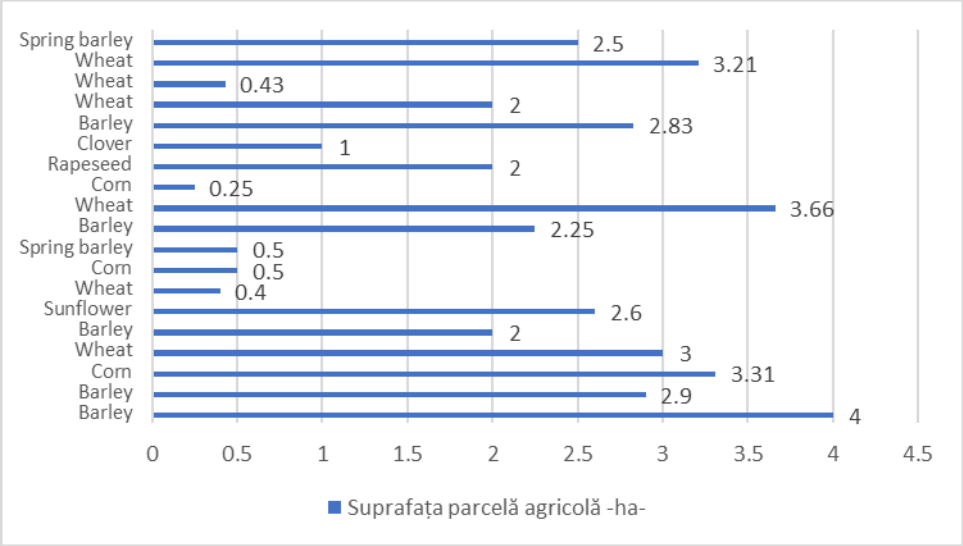

Figure 6. Area of the agricultural holding ID Farmer: RO004568707 – Year 2020

In 2020, barley was grown on most of the area: 13.98 ha, wheat: 12.7 ha and corn: 4.06 ha.

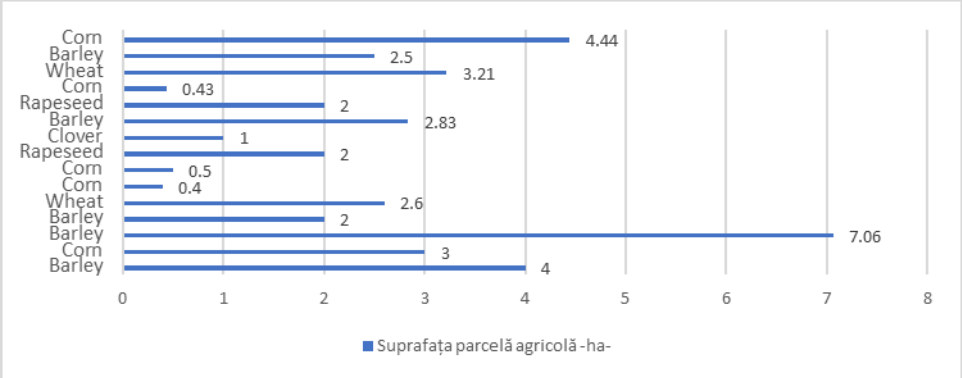

Figure 7. Area of the agricultural holding ID Farmer: RO004568707 – Year 2021

From figure 7 it can be seen that in 2021 the largest area was cultivated with wheat: 18.39 ha, followed by corn: 8.77 ha and barley: 5.81 ha.

http://doi.org/10.59463/RJAS.2025.2.14

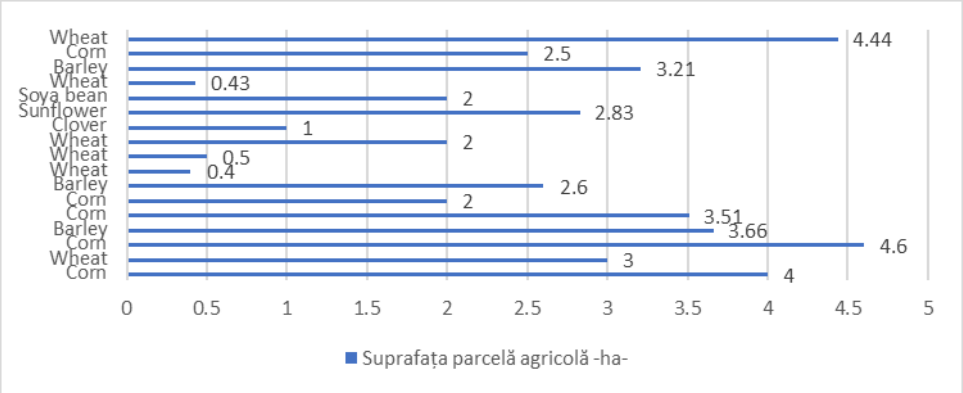

Figure 8. Area of the agricultural holding ID Farmer: RO004568707 – Year 2022

In 2022, it can be seen that the majority area was cultivated with corn: 16.61 ha, barley: 9.47 ha and wheat: 10.77 ha.

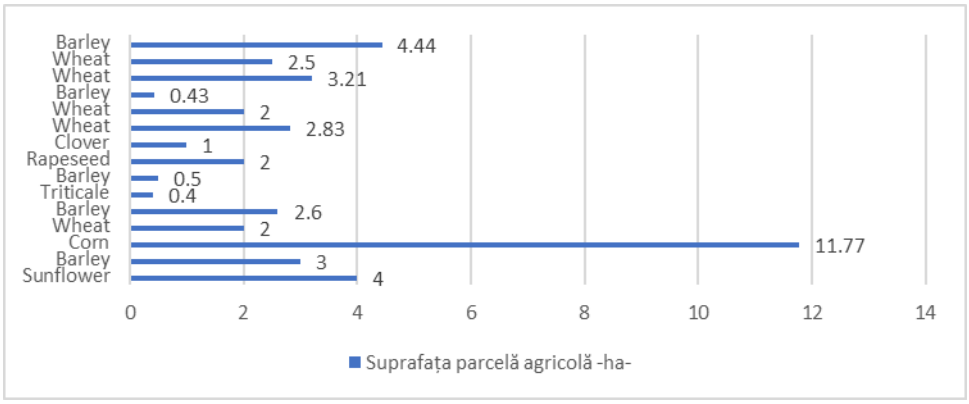

Figure 9. Area of the agricultural holding ID Farmer: RO004568707 – Year 2023

It can be seen from table 9 that in 2023, the preponderant area of the farm was cultivated with wheat: 12.54 ha, corn: 11.77 ha and barley: 10.97.

http://doi.org/10.59463/RJAS.2025.2.14

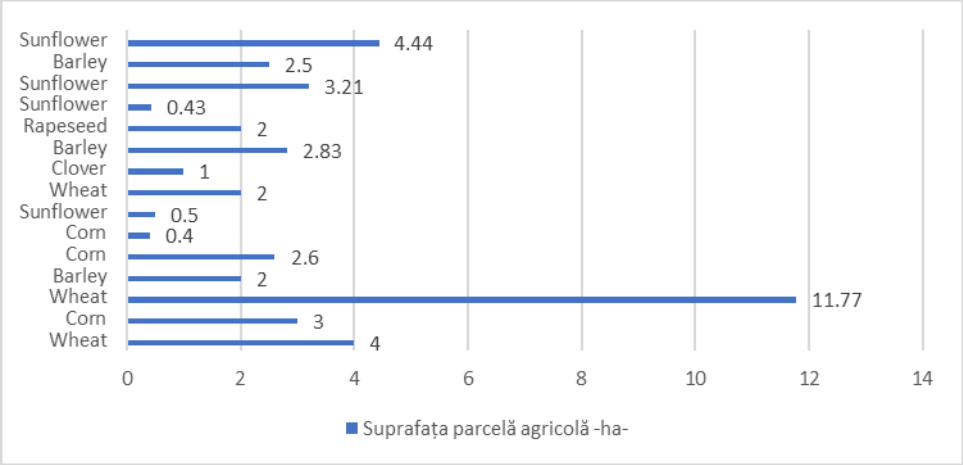

Figure 10. Area of the agricultural holding ID Farmer:: RO004568707 – Year 2024

In 2024, the majority crop was wheat: 17.77 ha, followed by sunflower: 8.58 ha and barley: 7.33 ha.

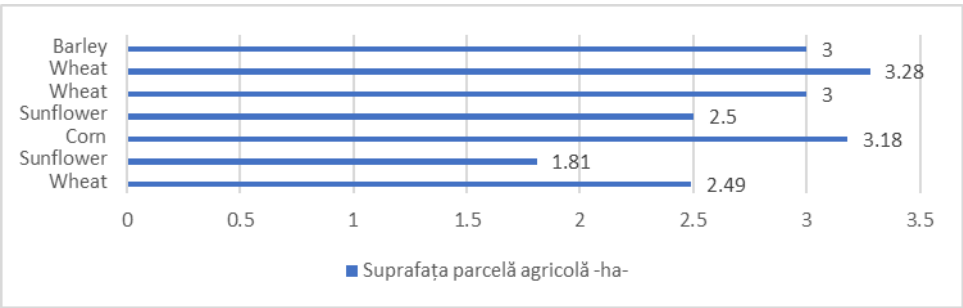

Figure 11. Area of the agricultural holding ID Farmer: RO249007817 – Year 2017

Within the agricultural holding, in 2017, the majority area was cultivated with wheat: 8.77 ha, followed by sunflower: 4.31 ha and corn: 3.18 ha.

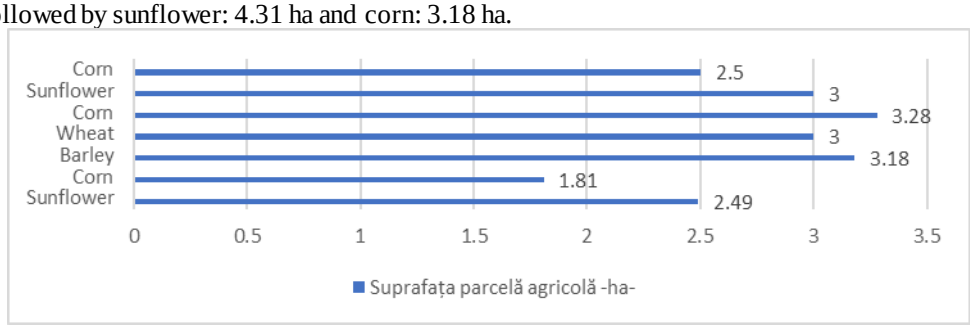

Figure 12. Area of the agricultural holding ID Farmer: RO249007817 – Year 2019

In 2019, most of the area was cultivated with corn: 7.59 ha, sunflower: 5.49 ha and barley: 3.18 ha.

http://doi.org/10.59463/RJAS.2025.2.14

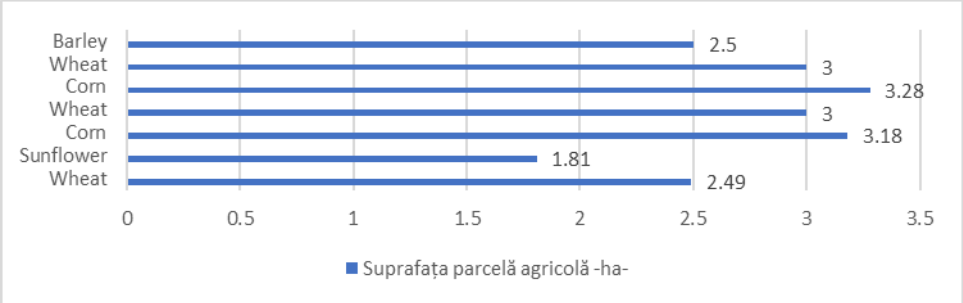

Figure 13. Area of the agricultural holding ID Farmer: RO249007817 – Year 2020

Figure 13 shows that, in 2020, wheat was mainly grown: 8.49 ha, corn: 6.46 ha and barley: 2.50 ha.

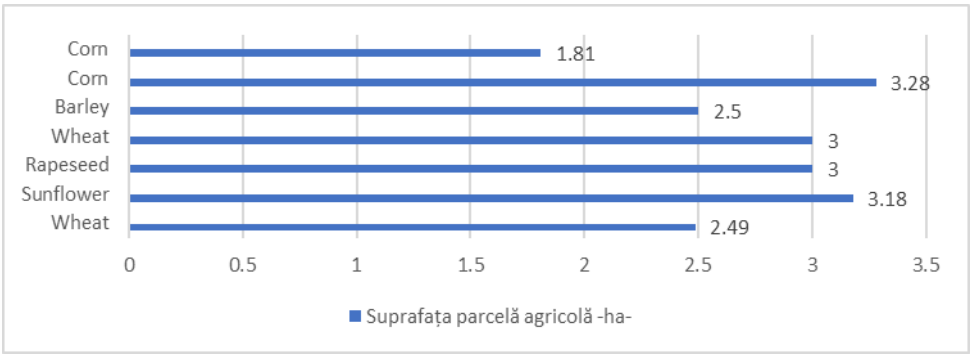

Figure 14. Area of the agricultural holding ID Farmer:: RO249007817 – Year 2021

In 2021, wheat was mainly grown: 5.49 ha, corn: 5.09 ha and sunflower: 3.18 ha.

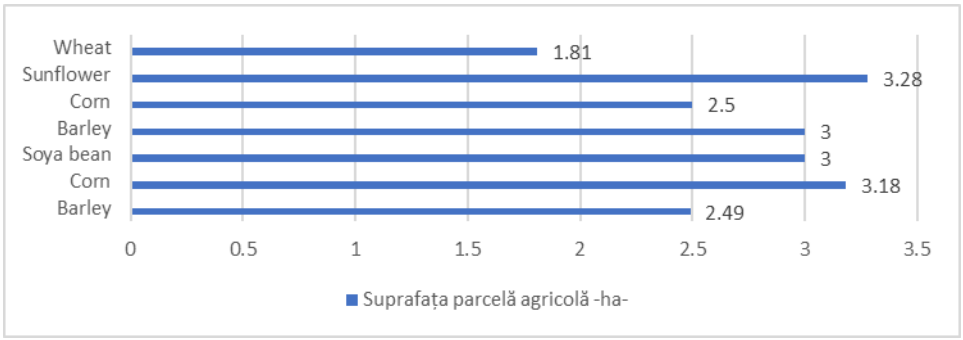

Figure 15. Area of the agricultural holding ID Farmer: RO249007817 – Year 2022

From figure 15 it can be seen that, in 2022, corn was mainly cultivated: 5.68 ha, barley: 5.49 ha and sunflower: 3.28 ha.

http://doi.org/10.59463/RJAS.2025.2.14

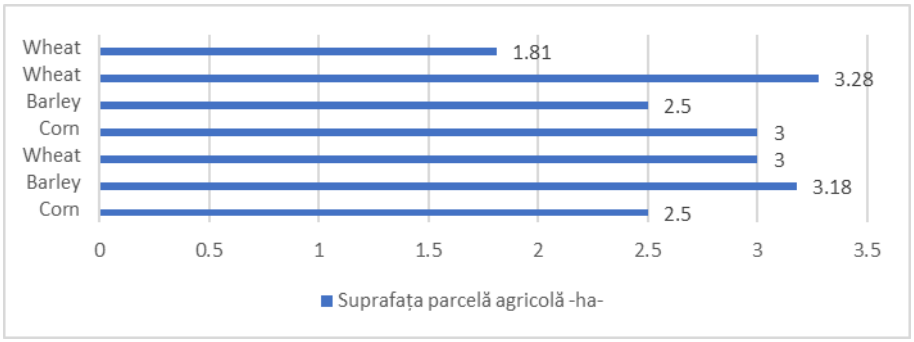

Figure 16. Area of the agricultural holding ID Farmer: RO249007817 – Year 2023

In 2023, the farm cultivated wheat: 8.09 ha, barley: 5.68 ha and corn: 5.5 ha.

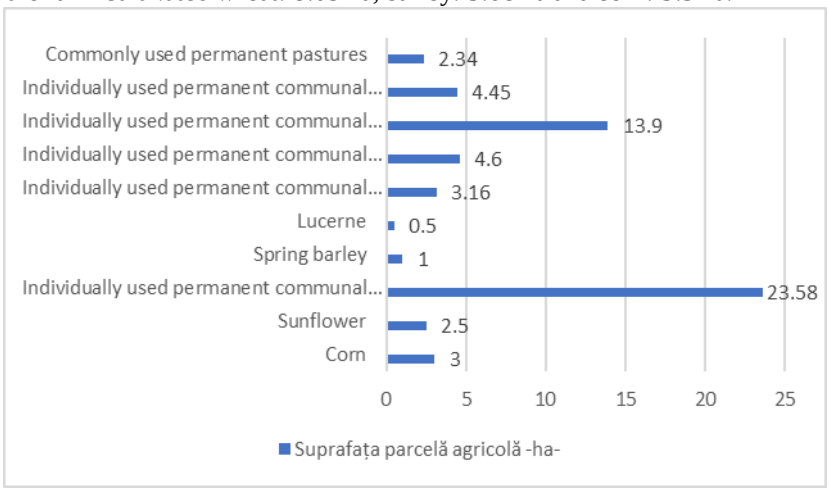

Figure 17. Area of the agricultural holding ID Farmer: RO279828247 – Year 2018

Figure 17 shows that in 2018, the predominant area was occupied by grasslands: 52.03 ha, followed by corn: 3 ha and sunflower: 2.50 ha.

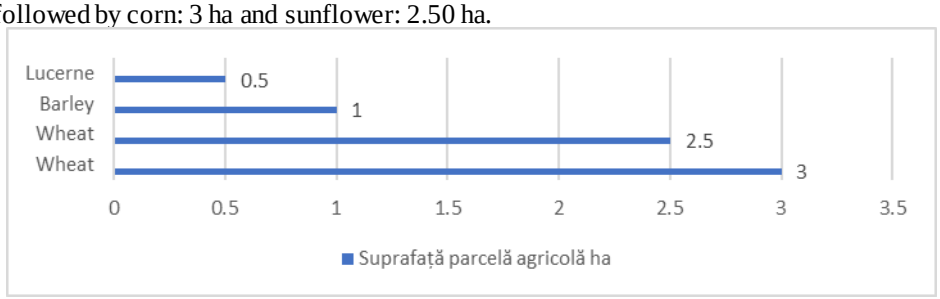

Figure 18. Area of the agricultural holding ID Farmer: RO279828247 – Year 2019

In 2019, most of the area held was occupied with wheat: 5.50 ha, barley: 1 ha and alfalfa: 0.50 ha.

http://doi.org/10.59463/RJAS.2025.2.14

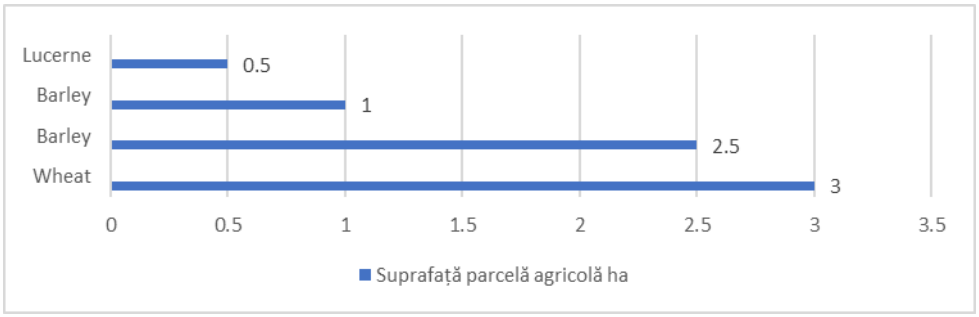

Figure 19. Area of the agricultural holding ID Farmer: RO279828247 – Year 2020

Figure. 19 shows that in 2020 the farm area was cultivated with barley: 3.50 ha, wheat: 3 ha and alfalfa: 0.50 ha.

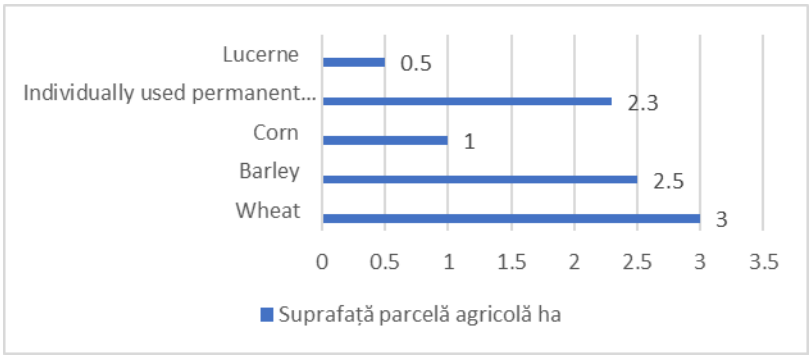

Figure 20. Area of the agricultural holding ID Farmer: RO279828247 – Year 2021

In 2021, the majority of the farm's area was occupied with wheat: 3 ha, followed by barley: 2.50 ha and meadows: 2.30 ha.

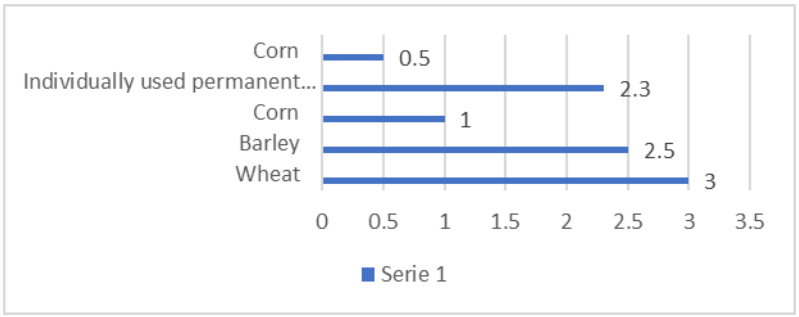

Figure 21. Area of the agricultural holding ID Farmer: RO279828247 – Year 2022

Figure 21 shows that in 2022 the farm was mainly occupied with wheat: 3 ha, barley: 2.50 ha and meadows: 2.30 ha.

http://doi.org/10.59463/RJAS.2025.2.14

CONCLUSIONS

1. The study presents 3 family farms studied during the years 2014 – 2024.The average size of the farm is approximately 30.10 ha.
2. The main crops on the farms are: wheat, barley, corn and sunflower
3. On small areas, fodder plants, rapeseed, soybeans, triticales and legumes are grown.
4. The structure of the crops is very fragmented, the smallest area is 0.25 ha, and the largest is 23.58 ha of communal permanent grassland used individually, but as far as field crops are concerned, this interval stops at the maximum of 11.77 ha.
5. This makes practicing an intensive farming system impossible, as tillage has to be carried out with low-performance machinery.
6. The association of farmers and the consolidation of land would be a solution for making the agricultural system more efficient.

BIBLIORAPHY

1. ADEUX G, MUNIER-JOLAIN N, MEUNIER D ET AL., 2019, Diversified grain-based cropping systems provide long-term weed control while limiting herbicide use and yield losses. Agron Sustain Dev 39:39– https://doi.org/10.1007/s13593-019-0587-x
2. ANDERSON RL., 2005, A multi-tactic approach to manage weed population dynamics in crop rotations. Agron J 97:1579–1583. https://doi.org/10.2134/agronj2005.0194
3. BOURGUET D, DELMOTTE F, FRANCK P et al., 2013, Heterogeneity of selection and the evolution of resistance. Trends Ecol Evol 28:110–118. https://doi.org/10.1016/j.tree.2012.09.001.
4. DAVIS AS, HILL JD, CHASE CA et al., 2012, Increasing cropping system diversity balances productivity, profitability and environmental health. PLoS One 7:1– https://doi.org/10.1371/journal.pone.0047149.
5. DUMA COPCEA ANISOARA, MIHUȚ, CASIANA, NIȚĂ, SIMONA, NIȚĂ, L., 2016, Distribution of 1st level monitoring sites per evaluation classes of some physical features of the soils within the commune of Sag, Timis county, Romania, Scientific Papers-Series Management Economic Engineering In Agriculture And Rural Development Volume 16, Issue 1, Page 135-137
6. LIEBMAN M, DYCK E (1993) Crop rotation and intercropping strategies for weed management. Ecol Appl 3:92–122. https://doi.org/10.2307/1941795
7. MACLAREN C, STORKEY J, STRAUSS J et al., 2019, Livestock in diverse cropping systems improve weed management and sustain yields whilst reducing inputs. J Appl Ecol 56:144–156. https://doi.org/10.1111/1365-2664.13239.
8. MAHAUT L, GABA S, FRIED G, 2019, A functional diversity approach of crop sequences reveals that weed diversity and abundance show different responses to environmental variability. J Appl Ecol 56:1400–1409. https://doi.org/10.1111/1365-2664.13389.
9. MIHUȚ CASIANA, L NIȚĂ, 2018, Atmospheric factors used to characterize soil resources. Research Journal of Agricultural Science. Research Journal of Agricultural Science, 50 (1)
10. MIHUȚ CASIANA, VALERIA CIOLAC, ANIȘOARA DUMA COPCEA, ADALBERT OKROS, DANIELA SCEDEI, 2022, Aanalysis of the influence of pedogenesis factors on soil formation using modern methods. International Multidisciplinary Scientific GeoConference: SGEM; Sofia, Vol. 22, Iss. 3.1, (2022). DOI:10.5593/sgem2022/3.1/s13.27.
11. MORARIU LUCIAN, DIANA BLAGA, RUXANDRA GAITA, NICOLETA MATEOC-SIRB, 2009, Analysis of Production and Consumption of Agricultural Products in the Arad County. Bulletin UASVM Horticulture, 66(2)/2009 Print ISSN 1843-5254; Electronic ISSN 1843-5394, pg 1.)
12. SMITH RG, GROSS KL., 2007, Assembly of weed communities along a crop diversity gradient. J Appl Ecol 44:1046–1056. https://doi.org/10.1111/j.1365-2664.2007.01335.x.
13. STOATE C, BOATMAN ND, BORRALHO RJ et al., 2001, Ecological impacts of arable intensification in Europe. J Environ Manag 63:337 365. https://doi.org/10.1006/jema.2001.0473.

14. THRALL PETER H , JAMES D BEVER, JEREMY J BURDON, 2010, Evolutionary change in agriculture: the past, present and future. Evol Appl. 2010 Sep; 3(5-6): 405–408. doi: 10.1111/j.1752-4571.2010.00155.x)
15. WEISBERGER D, NICHOLS V, LIEBMAN M., 2019, Does diversifying crop rotations suppress weeds? A meta-analysis. PLoS One 14:1–12. https://doi.org/10.1371/journal.pone.0219847.