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**TRENDS IN PESTICIDE USE AND TRADE:
 FAOSTAT DATA AND IMPLICATIONS FOR ROMANIA**

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Abstract: This study analyzes trends in pesticide use and trade at the global and European levels, highlighting regional differences and the relationship between the intensity of use and economic efficiency. The analysis is based on indicators such as total consumption (thousand tons), use per unit of agricultural area (kg/ha), consumption efficiency (g/Int\$), and international trade flows, using FAOSTAT data for the period 2014–2023. The results indicate a general upward trend in pesticide use globally, with varying regional dynamics, characterized by intensification in the Americas and Oceania and stagnation or decline in Europe. The analysis highlights that high levels of pesticide use are not automatically associated with greater economic efficiency. At the European level, significant differences are observed between countries, and Romania ranks below the EU average in terms of both use and efficiency, characterized by a high dependence on imports. The results underscore the need to optimize pesticide use in correlation with economic efficiency and agricultural sustainability.

• **Introduction**

The use of pesticides is an essential component of modern agriculture, contributing to increased productivity and crop protection. Their distribution is not uniform worldwide, as it is influenced by economic and technological factors, as well as agricultural policies. The intensive use of pesticides has implications for the environment, health, and economic efficiency, which calls for a sustainability-oriented approach. The aim of this paper is to analyze the dynamics of pesticide use and trade at the global and European levels and to assess Romania's position.

• **Material and method**

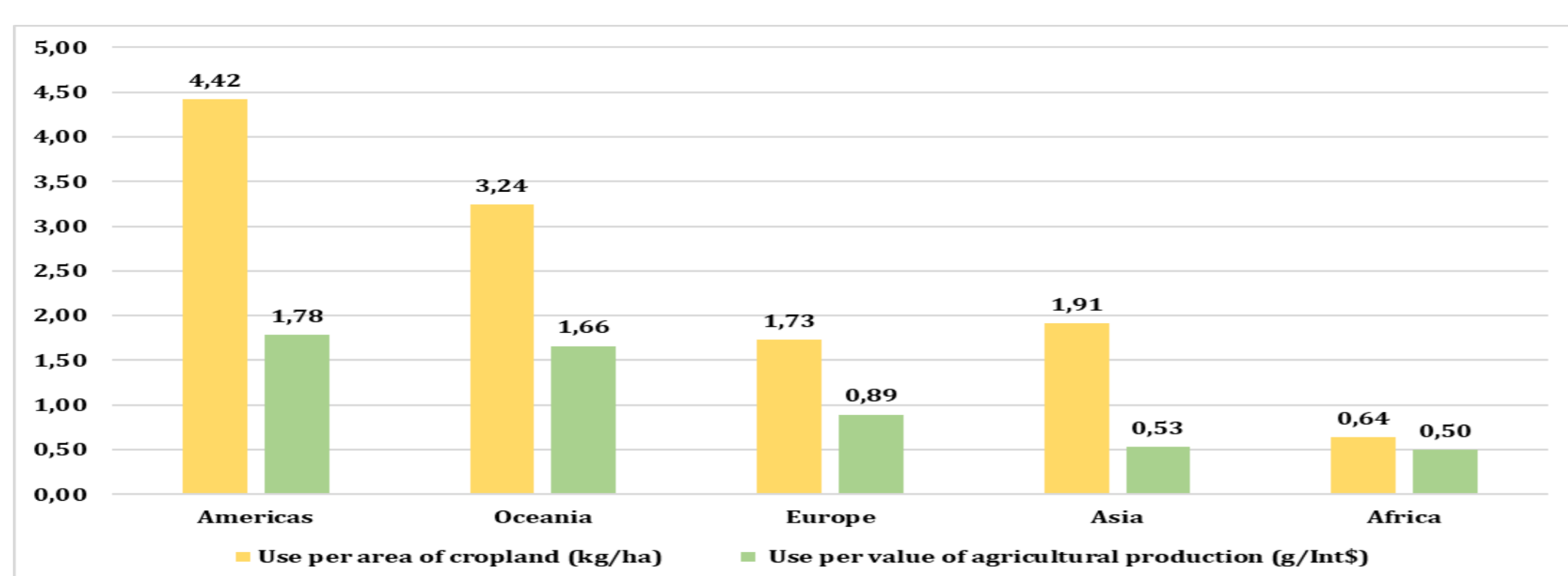
This study is based on an analysis of statistical data on pesticide use and trade, drawn from the FAOSTAT database.

Indicators used in the analysis: pesticide use per unit area (kg/ha), pesticide consumption efficiency (g/Int\$), trade – IDR and TCR.

Analytical methods: dynamic analysis, comparative analysis, simple linear regression, analysis of the gap between Romania and Europe.

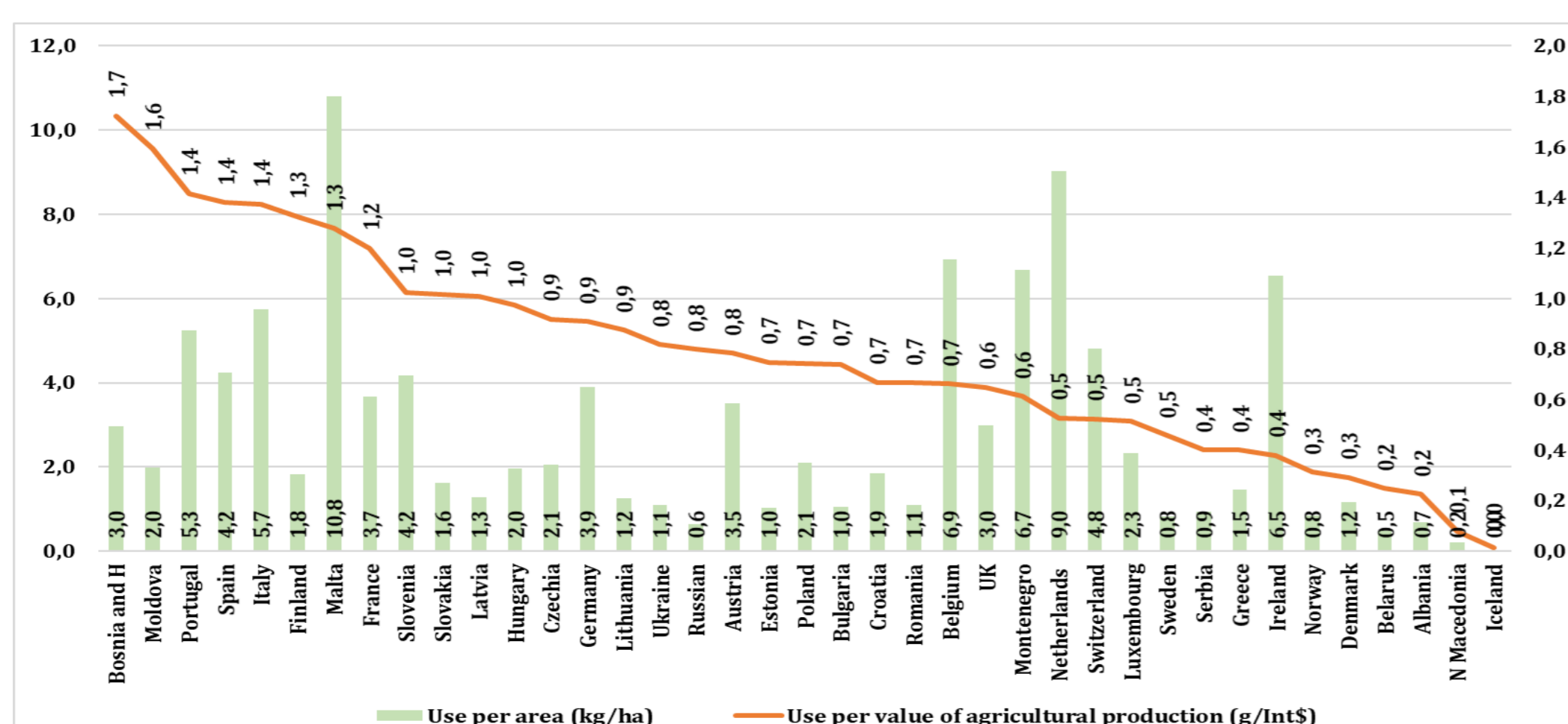
• **Results and discussions**

Pesticide use (kg/ha) by region



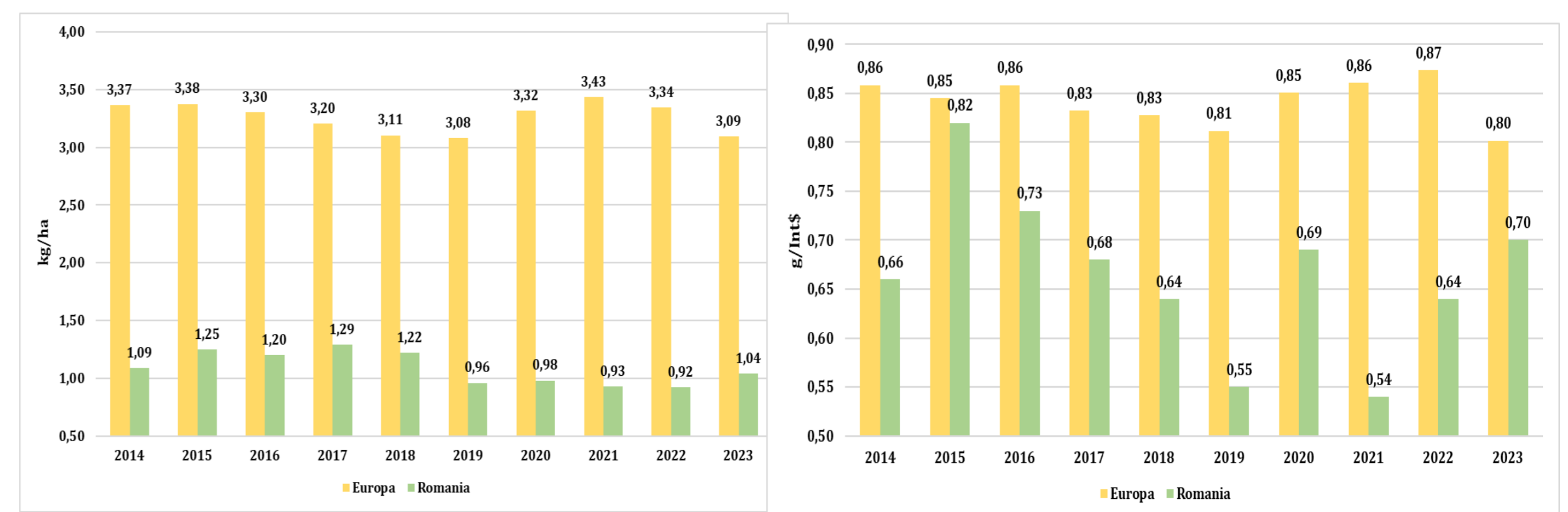
The Americas and Oceania have the highest levels of pesticide use, while Europe has moderate levels and Africa has the lowest.

The relationship between application rate and efficiency (kg/ha and g/Int\$)



Increased pesticide use is associated with a rise in consumption relative to output, indicating lower economic efficiency.

The difference between Romania and the European average



Romania ranks below the European average in terms of both pesticide use and consumption efficiency, with a slow trend toward convergence over time.

The IDR and TCR business indicators

Summary indicators of import dependence (IDR) and trade coverage (TCR) for Romania and Europe

Indicators	Romania	Europe
IDR tone	0.849	0.683
IDR USD	0.791	0.693
TCR tone	18	140
TCR USD	27	120

Source: Author's calculations based on FAOSTAT data

Romania is highly dependent on imports and has limited capacity to offset them through exports.

• **Discuții**

- Romania is highly dependent on imports and has limited capacity to offset them through exports.

The results show that high levels of pesticide use do not necessarily lead to economic performance: efficiency depends on productivity, technology, and crop structure.

- Variations across regions reflect distinct agricultural patterns, as well as differences in regulations and technological levels.

- Policies in this area influence both use and trade flows, steering practices toward controlled use.

- In Romania's case, the low level of use and efficiency, along with dependence on imports, suggests a need to increase the efficiency and use of inputs and to strengthen domestic capacity.

• **Conclusions**

- Pesticide use is on the rise globally, though with significant differences between regions, driven by economic, technological, and political factors

- The intensity of pesticide use does not necessarily lead to increased economic efficiency, highlighting the need to optimize the balance between inputs and outputs

- Regional differences and agricultural policies influence both use and trade, contributing to distinct patterns of production and consumption.

- The European market is characterized by trade polarization between exporting countries and import-dependent countries.

- Romania ranks below the European average and is import-dependent, which necessitates increasing the efficiency of pesticide use and strengthening domestic production capacity.