



**National Academy of Sciences of Ukraine  
Institute of Plant Physiology and Genetics**

**ECOLOGIZATION OF AGRARIAN  
PRODUCTION: EFFICIENCY OF  
DEVELOPMENT AND PROSPECTS OF  
IMPLEMENTATION OF INNOVATIVE  
TECHNOLOGIES  
IN INDEPENDENT UKRAINE**

**12th INTERNATIONAL CONFERENCE OF  
ECOSYSTEMS (ICE2022)**

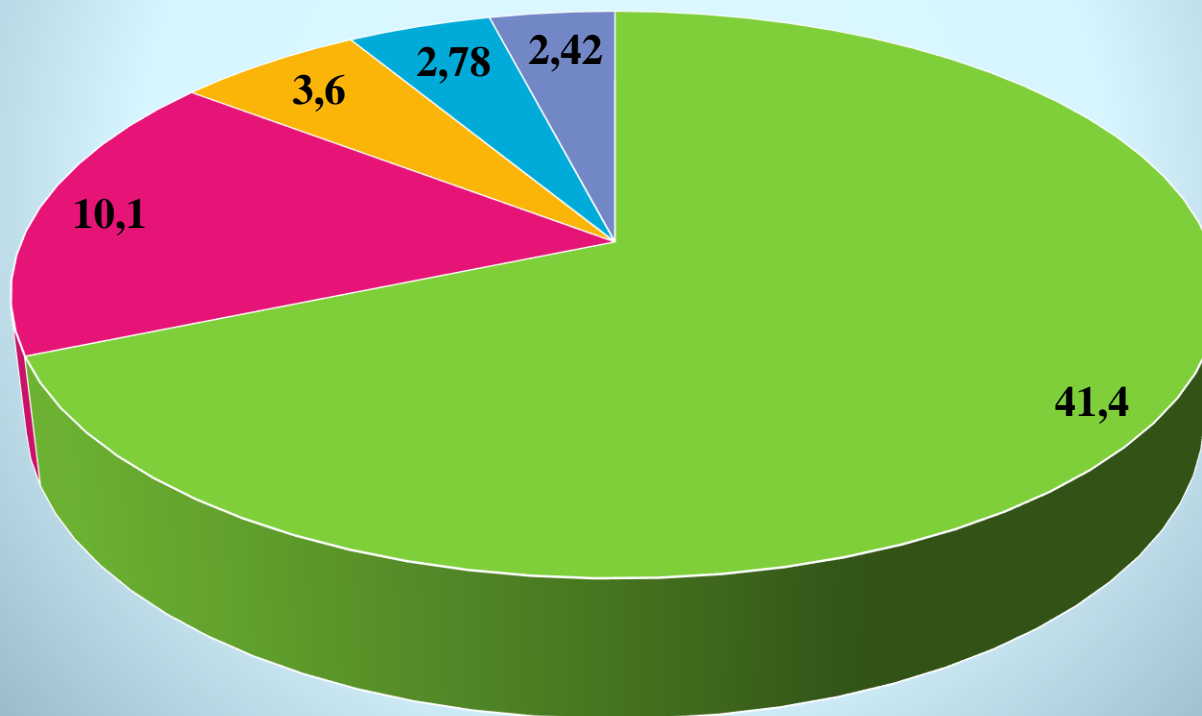
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## LAND FUND OF INDEPENDENT UKRAINE IN 2020, MILLION HECTARES

(source: State Statistics Service of Ukraine)

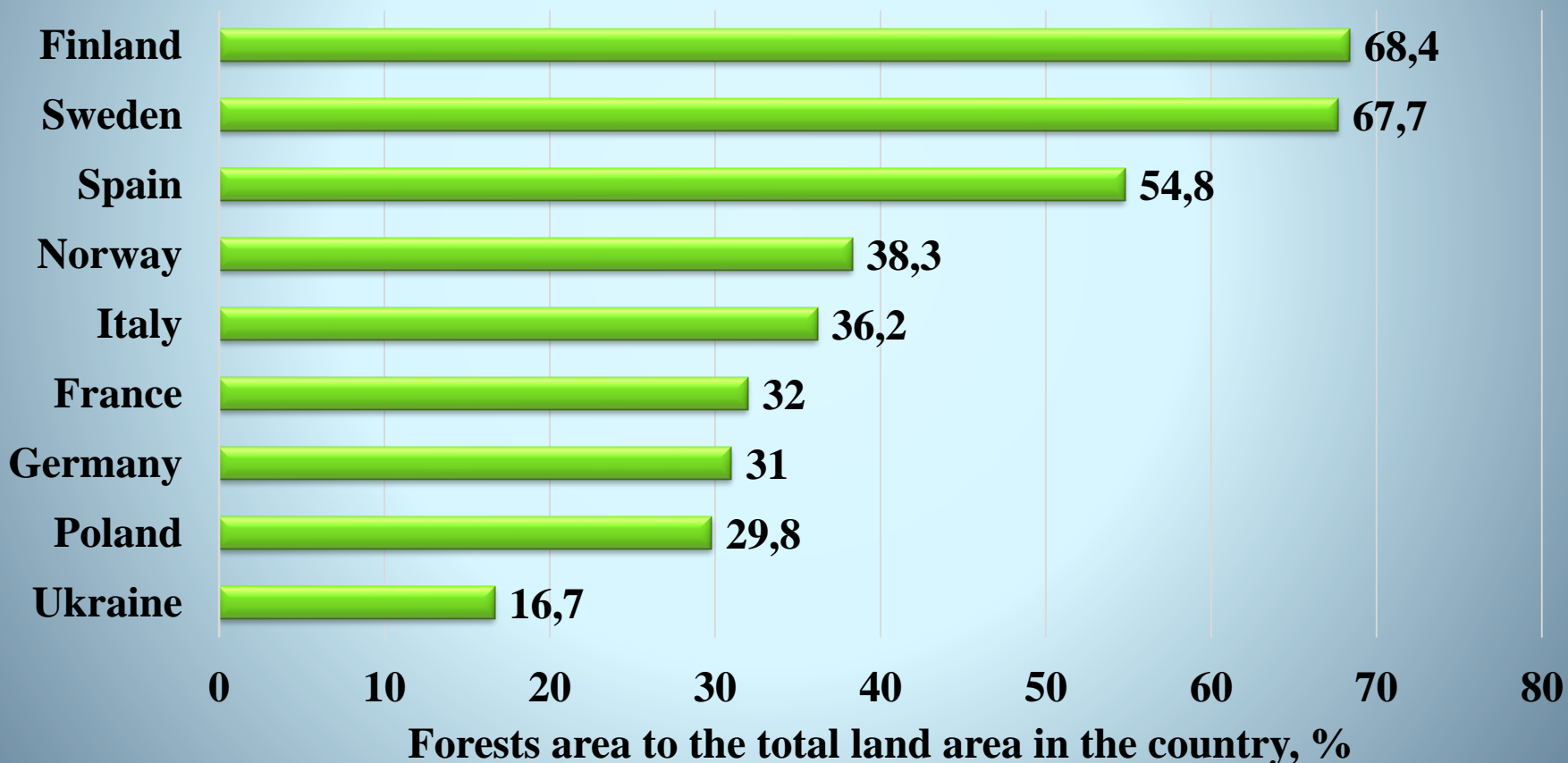
During 1990–2020, the area of agricultural lands of independent Ukraine was an excessively large share of the total area of its land – 68,7–69,7%. This has led to a violation of the ecologically balanced ratio of agricultural lands, forests and water bodies, which has negatively affected the sustainability of agroecosystems and caused a significant technogenic load on the ecological component of soils.



■ Agricultural lands ■ Forests ■ Built-up lands ■ Recreational lands ■ Water bodies

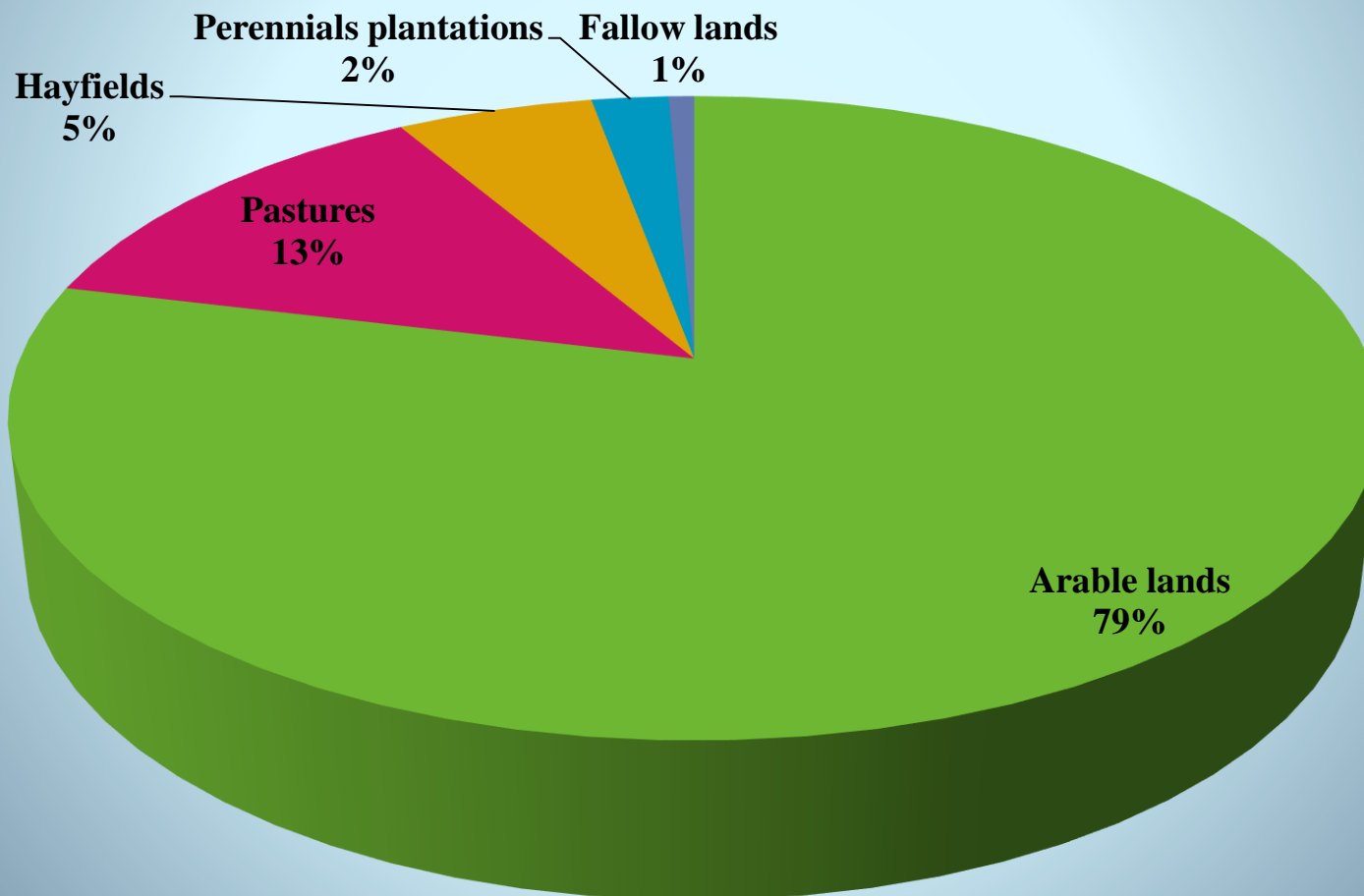
## FORESTS AREA IN INDEPENDENT UKRAINE AND OTHER EUROPEAN COUNTRIES IN 2020 (source: State Agency of Forest Resources of Ukraine)

In 2020, the arable lands in relation to the total land area of independent Ukraine was the highest among all European countries.



## THE STRUCTURE OF AGRICULTURAL LANDS IN INDEPENDENT UKRAINE IN 2020 (source: State Statistics Service of Ukraine)

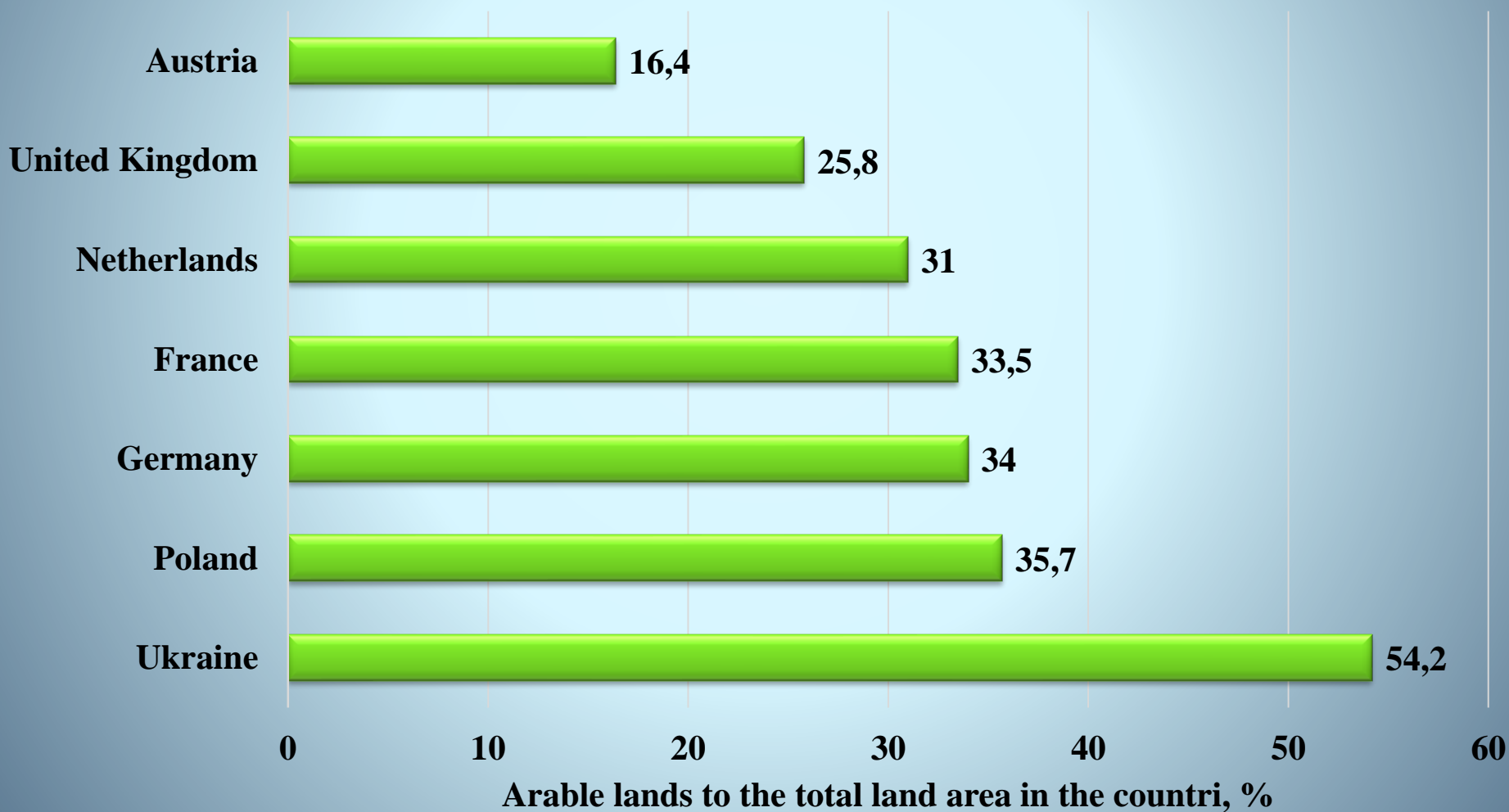
During 1990–2020, the distribution of agricultural lands was characterized by excessive plowing and development of the territory of independent Ukraine.



# ARABLE LANDS TO THE TOTAL LAND AREA IN INDEPENDENT UKRAINE AND OTHER EUROPEAN COUNTRIES IN 2020

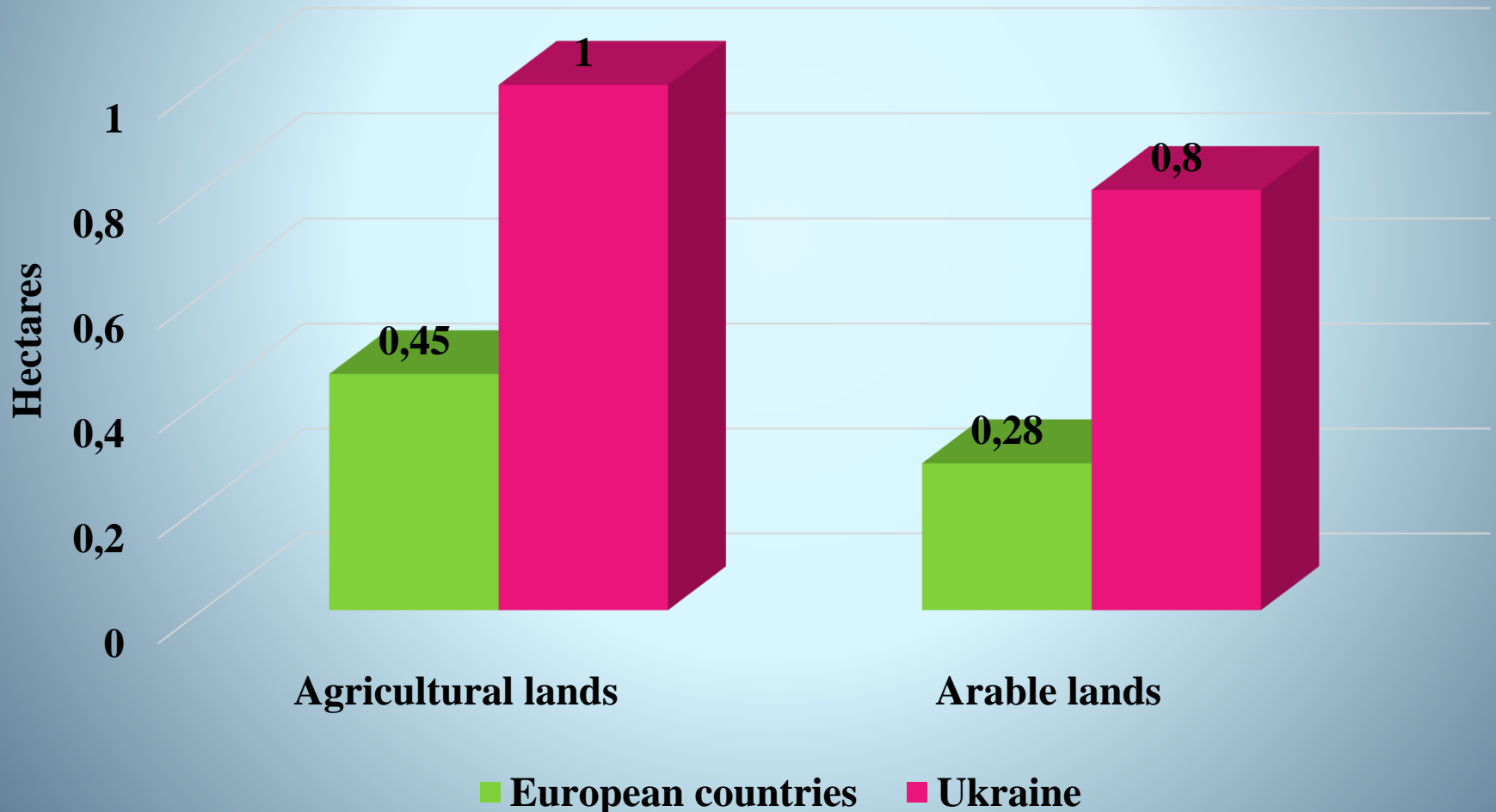
(source: State Statistics Service of Ukraine)

In 2020, the arable lands in relation to the total land area of independent Ukraine was the highest among all European countries.



# AREA OF AGRICULTURAL LANDS AND ARABLE LANDS PER PERSON IN INDEPENDENT UKRAINE AND OTHER EUROPEAN COUNTRIES IN 2020 (source: FAO)

In 2020, the provision of agricultural lands and arable lands per capita in independent Ukraine became the largest among European countries and in the world.

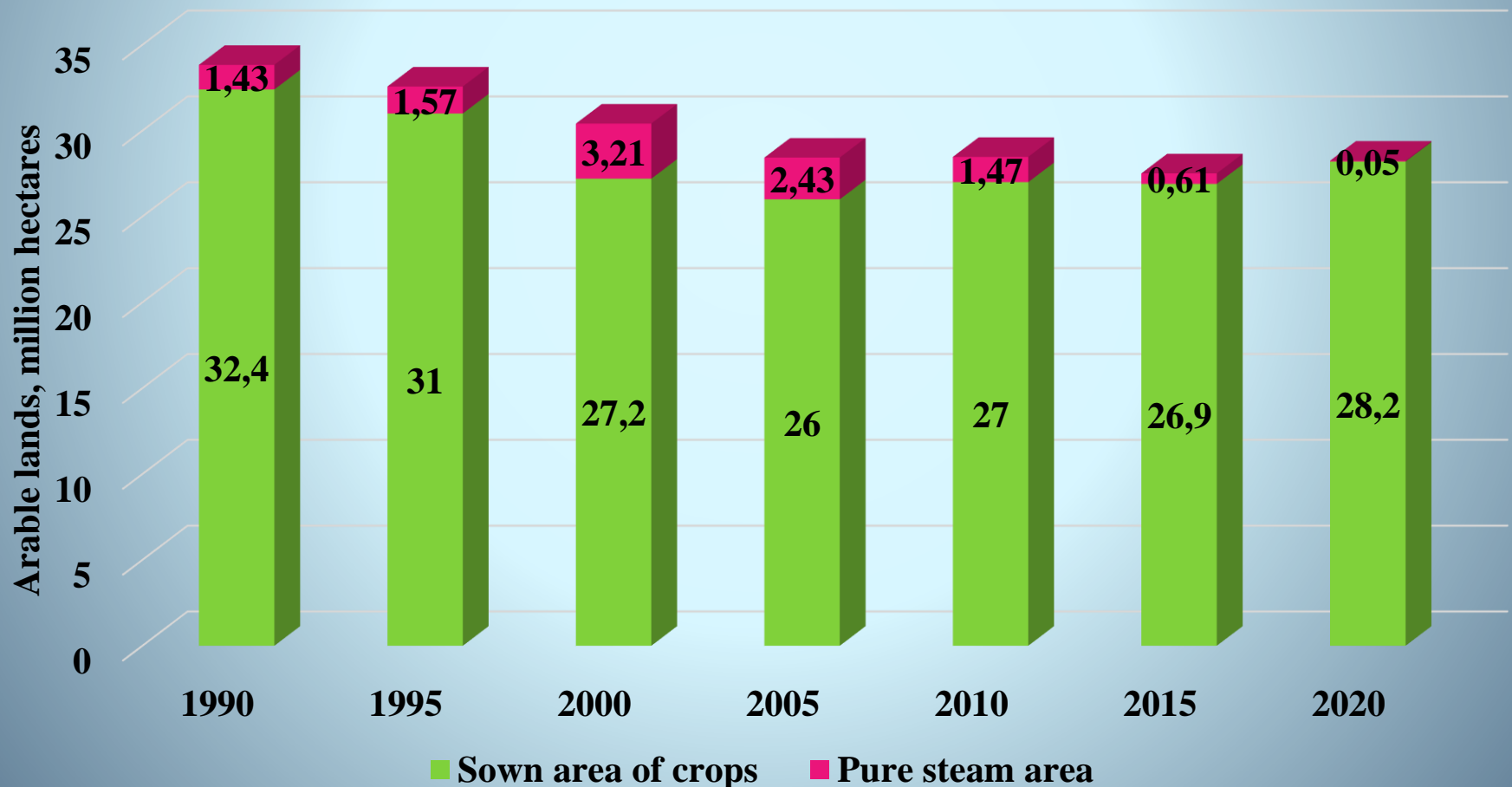




# DYNAMICS OF LANDS USE IN INDEPENDENT UKRAINE DURING 1990–2020, MILLION HECTARES

(calculated by the author according to the data for the State Statistics Service of Ukraine)

During 1990–2020, the lands use in independent Ukraine took place without observing the scientifically substantiated alternation of crops and pure steam in crop rotations. This indicates a high load on the soil and the need to develop and implement innovative environmentally friendly technologies in different soil and climatic conditions of independent Ukraine.



**DURING 1991–2021, THE ECOLOGIZATION OF AGRARIAN PRODUCTION IN INDEPENDENT UKRAINE IS BASED ON INNOVATIVE TECHNOLOGIES THAT ARE CHARACTERIZED BY REGIONAL, SECTORAL, FUNCTIONAL, SCIENTIFIC-TEHNOLOGICAL AND ORGANIZATIONAL FEATURES:**

- regional aspect is used for different soil and climatic conditions of Ukraine – Steppe, Forest-Steppe and Polissya;**
- sectoral aspect combines different areas of agrarian research in farming, ecology, agrochemistry and soil science, physiology, seed production, breeding and genetics, entomology and phytopathology, animal husbandry and others;**
- the functionality of innovations depends on the use of energy-saving and resource-saving technologies for the rationalization of agroecosystems;**
- scientific-technological direction provides optimization of the structure of sown areas and crop rotations, development of new types of organic fertilizers, sideration, mulching, vermiculture, soil protection tillage, biological plant protection, etc.;**
- organizational features are the use of the principle of specialization, which is used in the cultivation of different groups of crops: cereals, legumes, technical, fodder, vegetable and others. In animal husbandry, according to the principle of specialization, there are farms for the production of cattle, pigs, and poultry.**



**DURING 1991–2021, THE INNOVATIVE TECHNOLOGIES DEVELOPED ON THE BASIS OF SOIL PROTECTION FARMING FOR ECOLOGIZATION OF AGRARIAN PRODUCTION IN THE STEPPE, FOREST-STEPPE AND POLISSYA OF INDEPENDENT UKRAINE:**

- **"No-till" technology, in which unploughed soil in the field permeates billions of capillaries left after the root system of crops and is formed as a result of the life of earthworms and other organisms;**
- **"Strip-till" technology, in which only the sowing strip is cultivated and the soil between the rows remains intact;**
- **"Precision farming" technology is based on the automation of processes and the introduction of innovations that provide effective management of natural resources, control of their use and quality assessment;**
- **"Bioenzymatic farming" technology makes completely barren desert sands fertile. This is due to a single application of bentonite for 7–10 years, which is a good hydrant, sorbent and nutrient for autotrophic bacteria;**
- **"Biogenic farming" technology, which is based on the use of local-vertical type of tillage, planting shrub strips across the slopes;**
- **"Organic farming" technology, which is a holistic process of ecologization of agrarian production. Based on restrictions on the use of chemical fertilizers, pesticides, genetically modified organisms, food additives and more. Preference is given to the introduction of energy-saving and resource-saving technologies in order to provide the population with sufficient quality, safe food with minimal negative impact on the environment while maintaining the quality of soils, biodiversity and ecosystems.**

**UKRAINIAN AGRICULTURAL SCIENTISTS AND PRACTICES WHICH IMPROVE  
INNOVATIVE TECHNOLOGIES FOR ECOLOGIZATION OF AGRARIAN PRODUCTION  
IN DIFFERENT SOIL-CLIMATE CONDITIONS**



**S.S. Antonets**



**P.I. Boiko**



**I.D. Prymak**



**P.V. Pysarenko**



**I.A. Shuvar**



**S.P. Tanchyk**



**M.D. Voloshchuk**



**V.O. Yeshchenko**

# DEVELOPMENT OF INNOVATIVE TECHNOLOGIES FOR ECOLOGIZATION OF AGRARIAN PRODUCTION IN SCIENTIFIC MONOGRAPHS OF UKRAINIAN RESEARCHERS

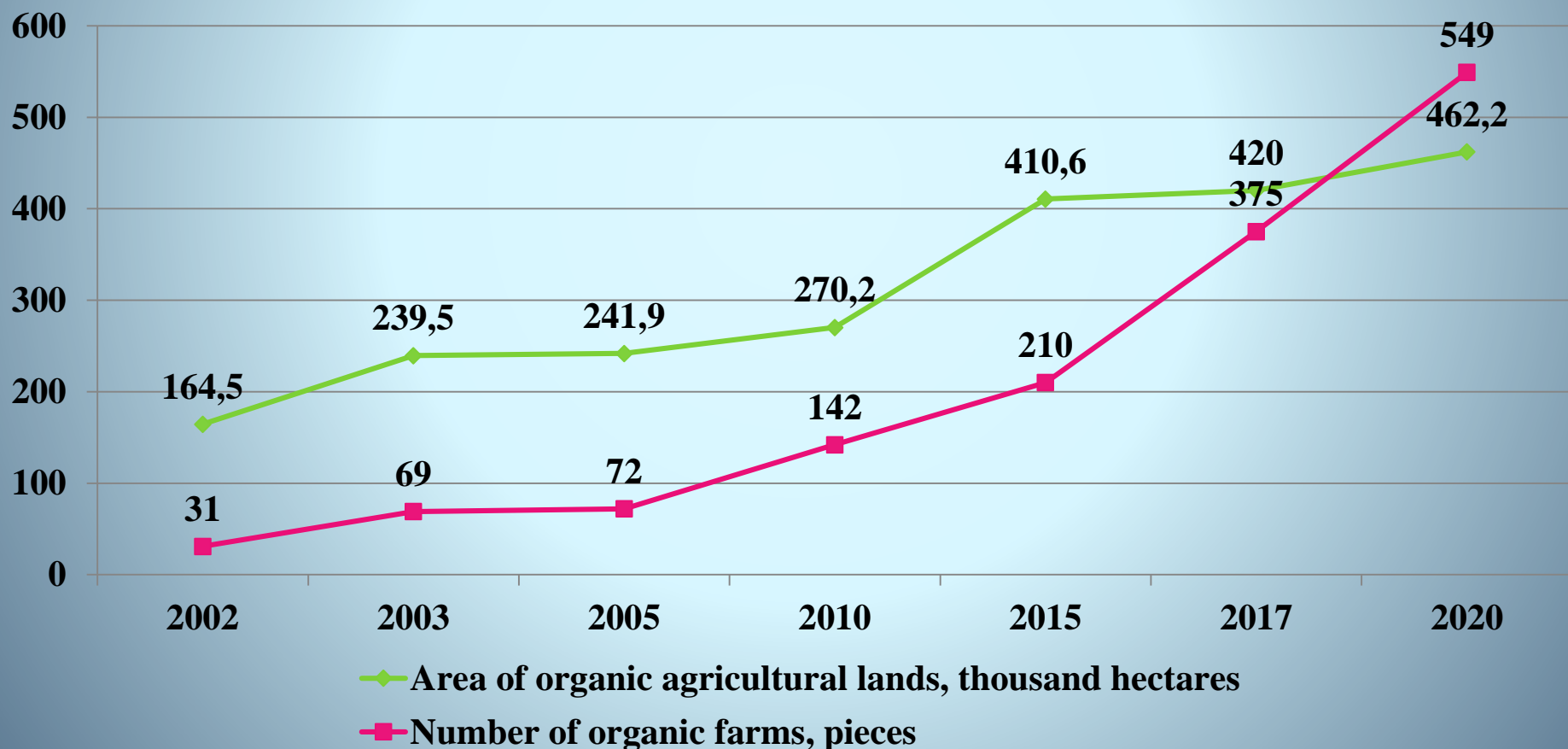




# DYNAMICS OF CERTIFIED AREAS OF ORGANIC AGRICULTURAL LANDS AND NUMBER OF ORGANIC AGRARIAN FARMS IN INDEPENDENT UKRAINE DURING 2002–2020

(calculated by the author according to the data for the Federation of Organic Movement of Ukraine)

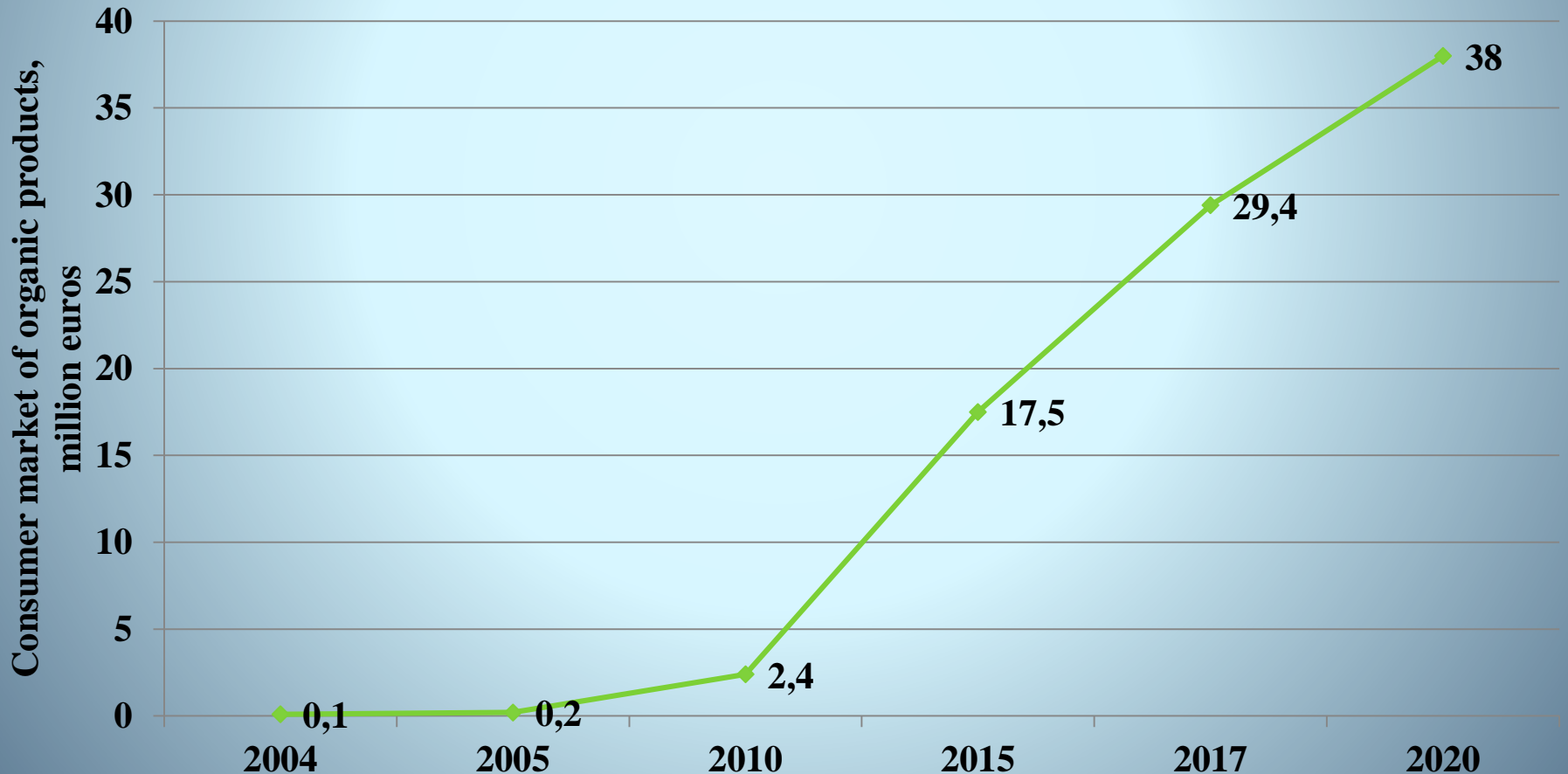
Demonstrating stable positive dynamics of growth of agricultural lands on which certified organic production is carried out, there is a steady increase in both the number of operators of the organic market and the level of consumption of organic products in independent Ukraine.



# DYNAMICS OF VOLUMES OF THE CONSUMER MARKET OF ORGANIC PRODUCTS IN INDEPENDENT UKRAINE DURING 2004–2020

(calculated by the author according to the data for the Federation of Organic Movement of Ukraine)

In 2004, the consumer market of organic products in independent Ukraine amounted to 100 thousand euros, and in 2020 increased to 38,0 million euros, that is almost 380 times.



# CONCLUSIONS

**THUS, DURING 1991–2021, THE INNOVATIVE ECOLOGICALLY SAFE TECHNOLOGIES WERE EFFECTIVELY DEVELOPED, WHICH WERE PROMISING IN AGRARIAN ENTERPRISES AND ENSURED THE DEVELOPMENT OF ECOLOGIZATION OF AGRARIAN PRODUCTION IN INDEPENDENT UKRAINE**

**Innovative ecologically safe technologies provide the maximum possible replacement of chemical fertilizers, pesticides, genetically modified organisms, preservatives – a set of the latest competitive measures based on natural ingredients.**

**Innovative ecologically safe technologies do not have a detrimental effect on soil condition, increase fertility and maintain the quality of the agroecosystems, raise productivity and quality of agricultural products in accordance with international standards. Their implementation will guarantee ecological safety of the environment both in independent Ukraine and world.**



**Thank you for listening!**