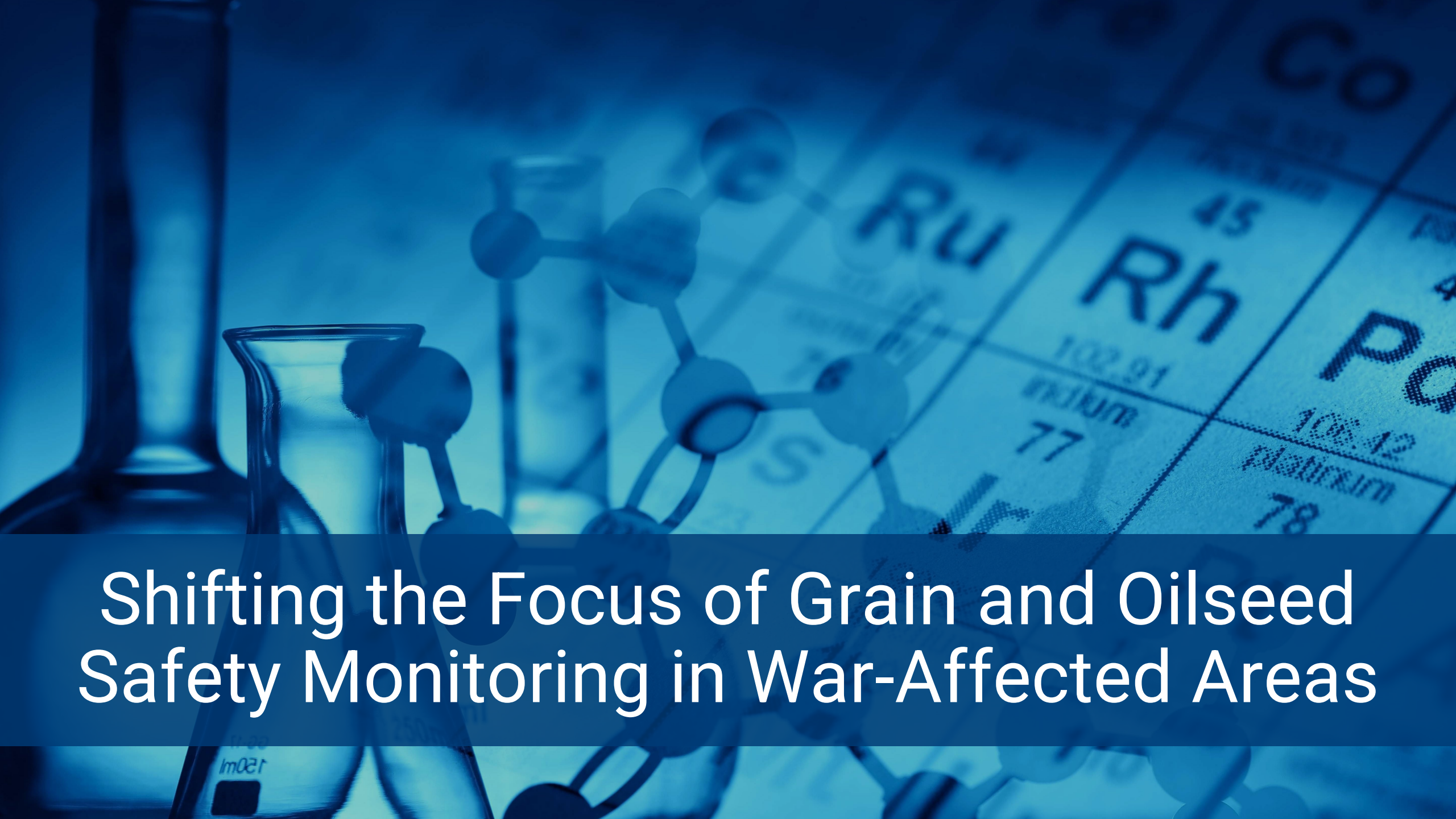


Shifting the Focus of Grain and Oilseed Safety Monitoring in War-Affected Areas


CONTROLUNION
AGMINTEST
CONTACTS
LAB OPPORTUNITY
AGROCHEMICAL SHORTAGES
COMMODITIES
KEY QUESTIONS
STATISTICAL DATA
ACCREDITATIONS

CONTROLUNION
AGMINTEST

KEY QUESTIONS

RELEVANCE

GHG emissions

2 years of war

tCO_2e

175M

>

1 year The Netherlands

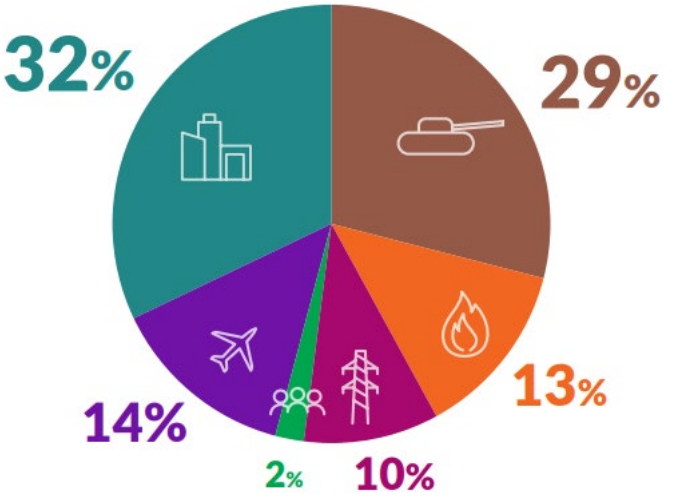
200 MW coal-fired power units

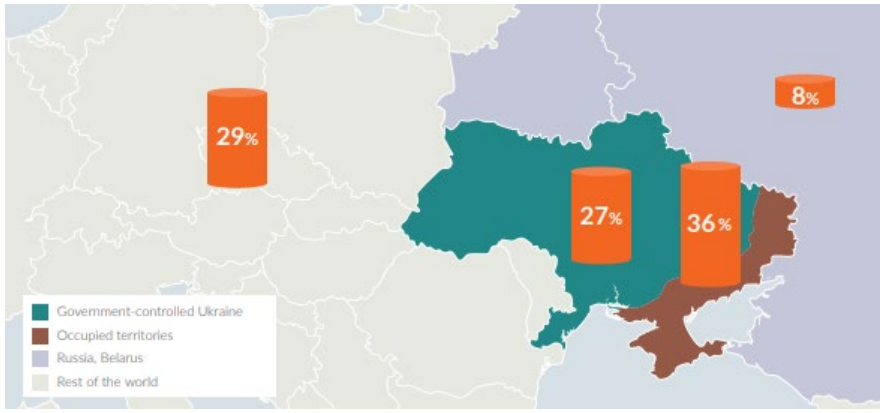
260

or

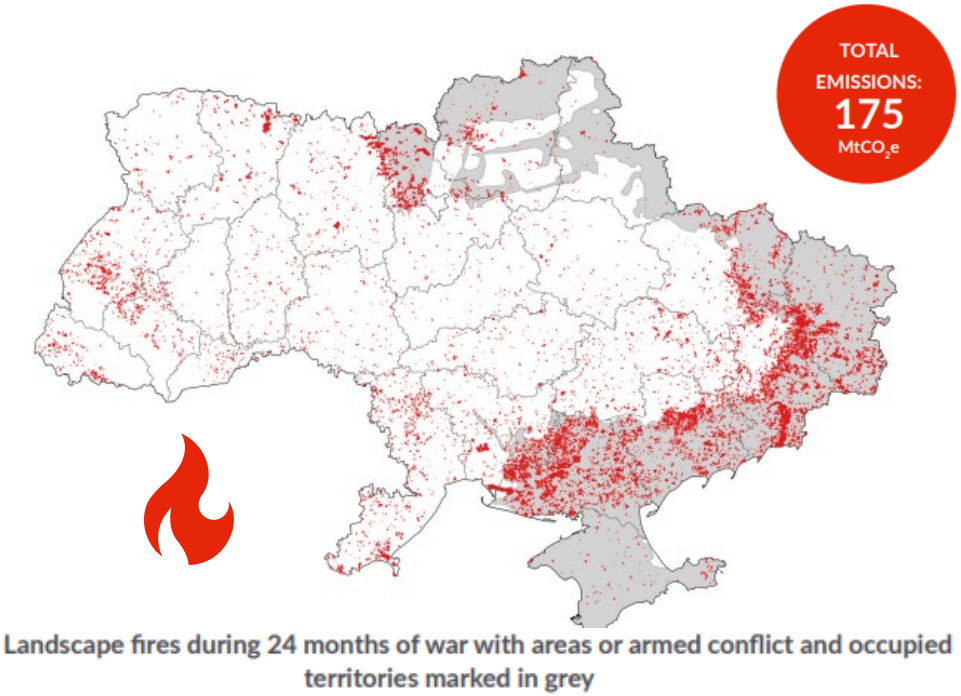
petrol cars on the road

90M

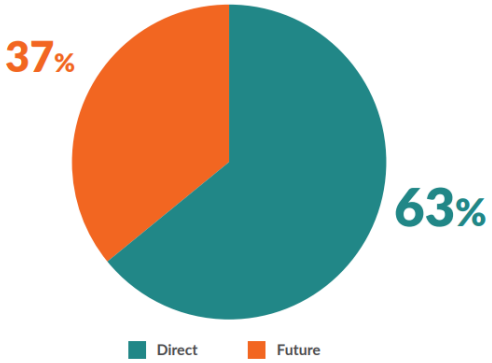




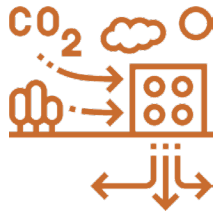
Total GHG emissions after 24 months of war



Landscape fires during 24 months of war with areas or armed conflict and occupied territories marked in grey



Distribution of emissions which occurred during 24 months of war and future emissions



Source: CLIMATE DAMAGE CAUSED BY RUSSIA'S WAR IN UKRAINE. Published under the Creative Commons ShareAlike Attribution Licence (CC BY-SA 4.0). https://en.ecoaction.org.ua/wp-content/uploads/2024/06/Climate-Damage-Caused-by-War-24-months-EN.pdf

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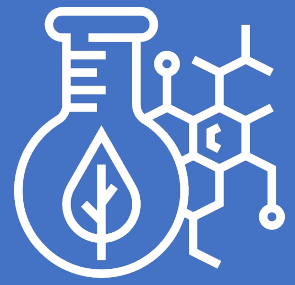
KEY QUESTIONS

RELEVANCE



Agro-military pollutants are harmful substances that contaminate the environment as a result of farming and warfare.

Another important factor influencing contaminant levels in grain and oilseed crops is the economic aspect, specifically the lack of funds for comprehensive treatment of harvested crops with agrochemicals.

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KEY QUESTIONS
MECHANISM

Soil pollution

Local military contamination or historical agricultural use involving agrochemical applications may have contaminated the soil. Agro-military pollutants can migrate through soil from nearby areas.

Airborne dispersal

Agrochemicals and military pollutants can be carried by the wind and settle on crops.

Water pollution

Agro-military pollutants can contaminate water used for irrigating crops. These pollutants can enter the water cycle through rainfall or irrigation, contaminating rivers, lakes, and aquifers, and eventually returning to the fields.

Contamination

Contamination of products during storage and transportation in conditions where residues of pesticides or chemicals are present in storage facilities or containers.

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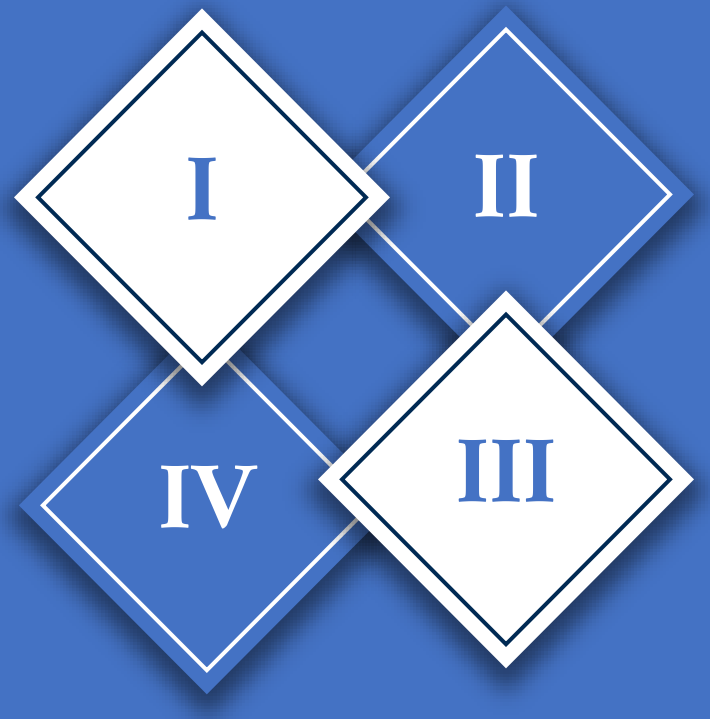
Routes of pollutant contamination

Direct pollution: Toxic elements are introduced directly into the soil, water, or atmosphere.
Secondary pollution: Occurs when these elements spread through groundwater and surface water, contaminating not only soils but also water resources over larger areas.

Types in use

The toxicity and bioaccumulation potential of chemical substances vary widely. The specific chemical makeup of weapons and munitions determines the types and amounts of hazardous materials that can contaminate the environment when used.



Strength and length

Long-term pollution may result in persistent soil and groundwater contamination. Large doses of pollutants lead to higher concentrations in plants and the surrounding environment.

Availability and types of industrial facilities

Wartime destruction of industrial facilities can lead to the release of hazardous substances into the environment. These pollutants, such as those emitted into the atmosphere, water, and soil, can contaminate agricultural lands.

CONTAMINANTS

military

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1

HEAVY METALS
HEAVY METALS

Iron (Fe) Copper (Cu)
Lead (Pb) Nickel (Ni)
Mercury (Hg) Zinc (Zn)
Cadmium (Cd) Arsenic (As)

Chromium (Cr)

- The primary sources of the increase in their content during military operations are: Ammunition, Military equipment, and Industrial enterprises.

2

CHEMICAL SUBSTANCES
CHEMICAL SUBSTANCES

Nitrates (NO_3^-)

- Nitrogen compounds that naturally occur in soil and plants but are the main component of many explosives.

- During explosions, they decompose and form nitrate compounds, which pollute the soil and water.

3

ORGANIC SUBSTANCES
ORGANIC SUBSTANCES

Polycyclic Aromatic Hydrocarbons (PAHs)

- formed as a result of the incomplete combustion of organic materials, such as fuels, plastics, and rubber.

Dioxins

- produced during the combustion of chlorine-containing materials, such as plastics, which may be present in equipment, gear, or buildings.

CONTAMINANTS

agrochemical

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1

FERTILIZERS
FERTILIZERS

Nitrogen

- Ammonium nitrate, Anhydrous ammonia, Urea, Ammonium sulfate, Ammonium sulfate nitrate, Calcium nitrate, Sodium nitrate.

Phosphorus

- Diammonium phosphate, Monoammonium phosphate, Superphosphate, Ammonium polyphosphate, Rock phosphate.

Potassium

- Potassium nitrate, Potassium sulfate, Potassium chloride, Potassium magnesium sulfate.

2

PESTICIDES
PESTICIDES

Herbicides

- 2,4-Dichloro phenoxy acetic acid, Acetochlor, Alachlar, Atrazine, Butachlor, Glyphosate, Metachlor, Propachlor, Paraquat.

Insecticides

- DDT, DDD, Dicofol, Dieldrin, Lindane, Heptaclor, Endosufan, Isobenzan, Toxaphene, Allethrin, Chlorpyrifos.

Fungicides

- Captan, Diflotan, Folpet, Mancozeb, Carbenazin, Carbendazim, Kitazin, Metalaxyl, Benomyl, Hexaconazole, Oxafun-T.

3

HEAVY METALS
HEAVY METALS

Iron **(Fe)** Copper **(Cu)**
Lead **(Pb)** Nickel **(Ni)**
Mercury **(Hg)** Zinc **(Zn)**
Cadmium **(Cd)** Arsenic **(As)**

- Among agricultural sources of heavy metals, fertilizers, pesticides, and sewage sludge are the most common.

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PRIME PRODUCT COSTS *CHANGE*

FOR INVOLVED IN AGRICULTURAL PRODUCTION *(FARMERS)*

KEY CHALLENGES:

- Soil contamination with heavy metals and chemicals
- Additional costs for land remediation and recovery
- Need for alternative restoration methods (bioremediation, phytoremediation)

PRACTICAL SOLUTIONS:

- Conducting soil tests to monitor quality
- Transitioning to more sustainable farming practices (Crop Rotation)
- Seeking financial support (grants, government aid, international initiatives)

WHAT DOES THIS MEAN?

- Production costs increase by at least **10%**
- Risk of reduced yields on contaminated land
- Long-term land restoration planning is necessary

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PRIME PRODUCT COSTS *CHANGE*

FOR INVOLVED IN SELLING PRODUCTS *(DISTRIBUTORS, RETAILERS)*

IMPACT ON BUSINESS:

- Higher procurement costs due to increased production expenses
- Stricter certification and safety compliance requirements
- Potential export limitations due to EU and international safety standards

HOW TO ADAPT:

- Work only with certified suppliers
- Implement additional laboratory testing in supply chains
- Optimize logistics to offset costs

CONSEQUENCES:

- Higher final product prices
- Growing demand for certified "clean" products
- Potential for expanding the "eco" segment

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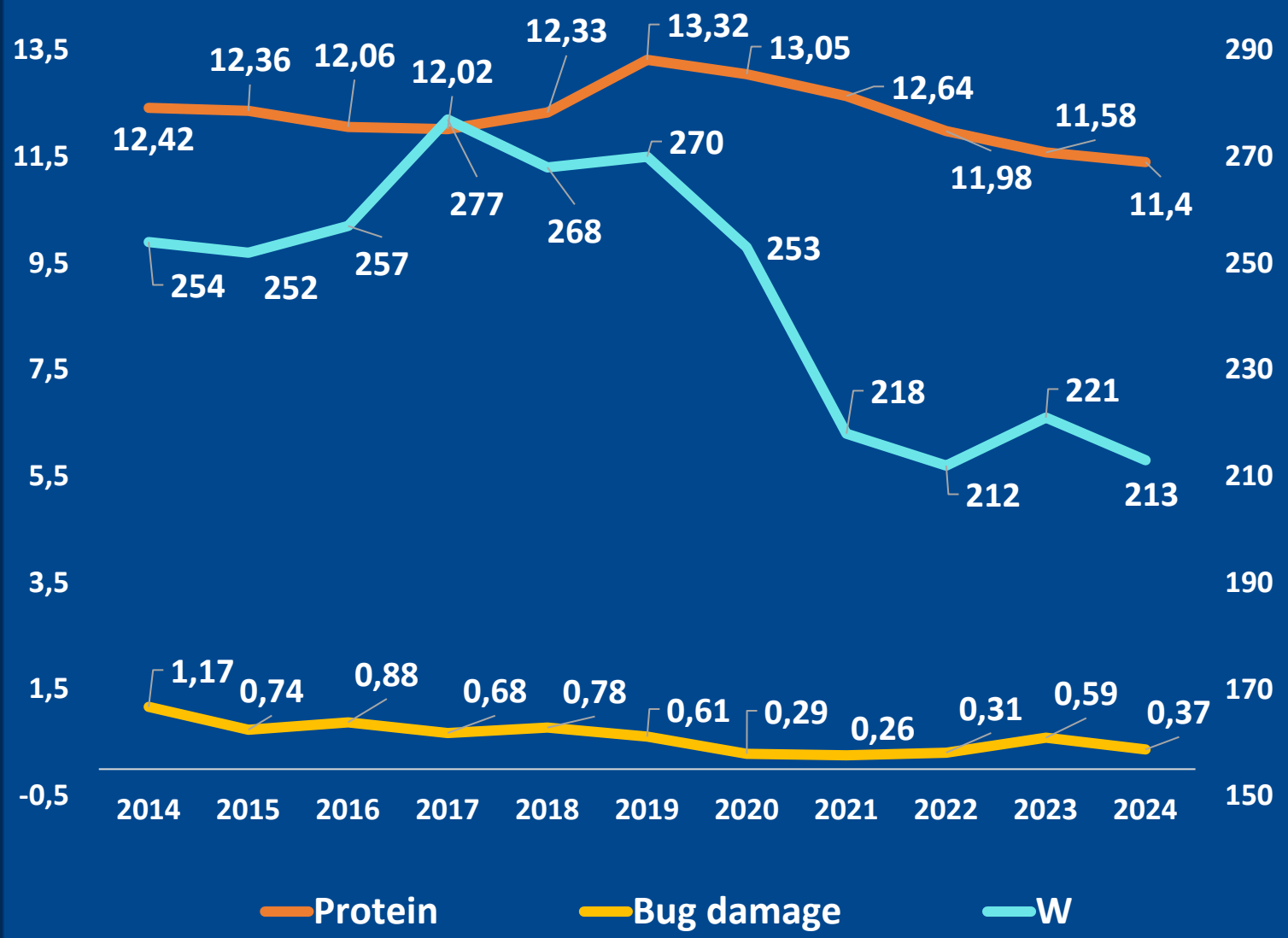
AGROCHEMICAL SHORTAGES

RISKS

UKRAINIAN WHEAT QUALITY 2014-2024 YEARS

(TESTED AT AGMINTEST)



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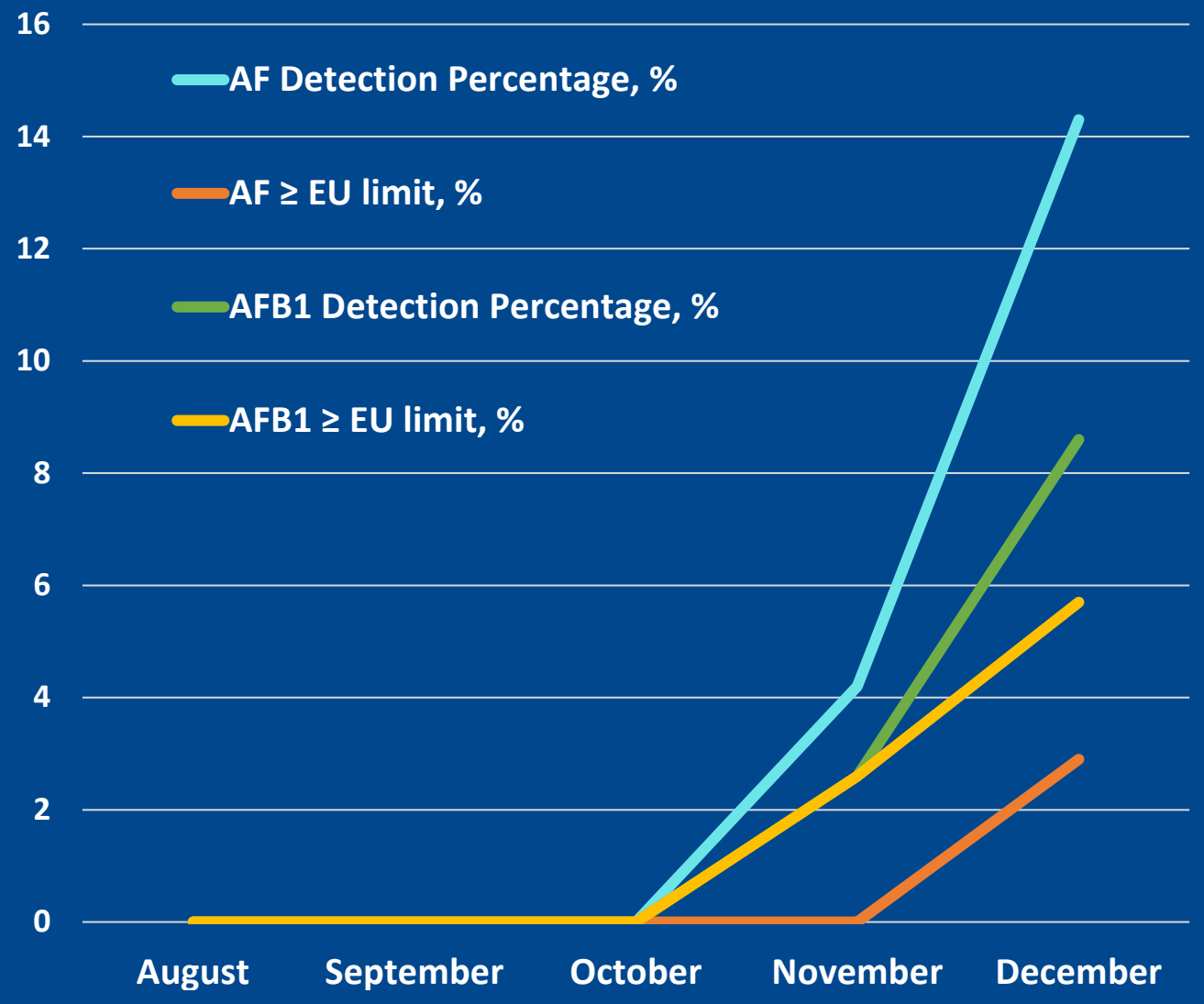
AGROCHEMICAL SHORTAGES *RISKS*

COMMISSION REGULATION (EU) 2023/915
on maximum levels for certain contaminants in food

Sum of AF – 10.0 µg/kg
AFB1 – 5.0 µg/kg

A TREND OF INCREASING PERCENTAGE OF AFLATOXINS DETECTION IN THE 2024 CORN HARVEST



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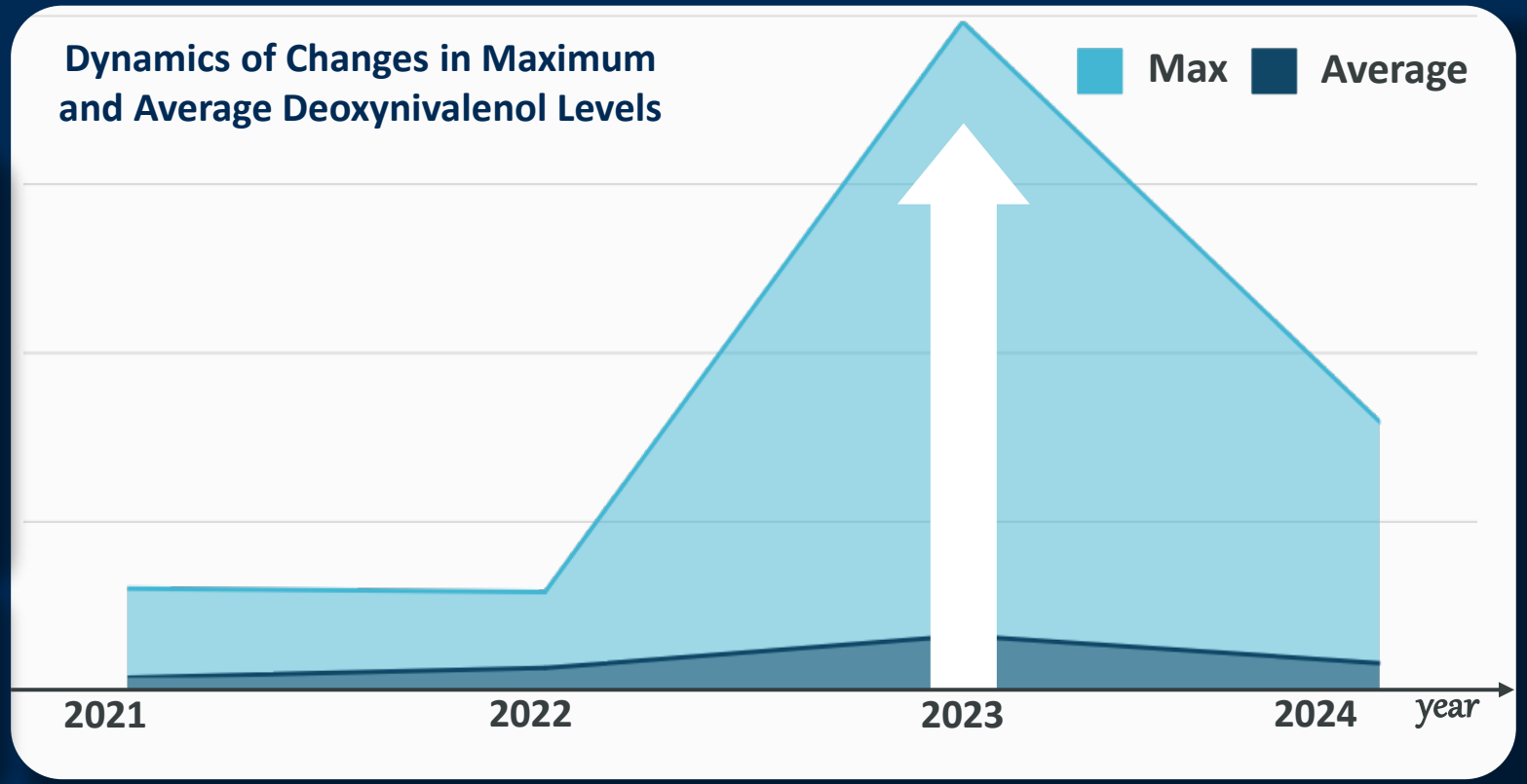
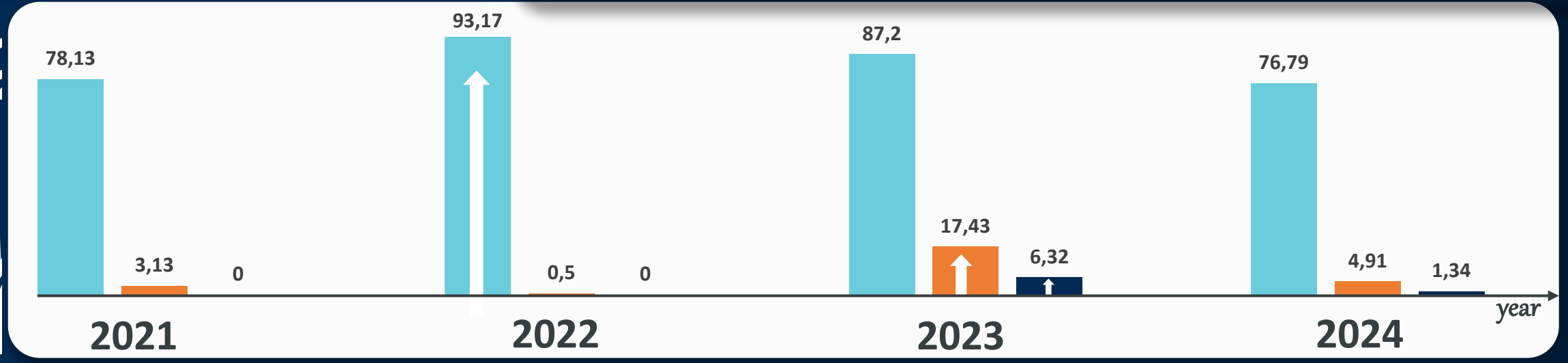
COMMISSION REGULATION (EU) 2024/1022
of 8 April 2024
amending Regulation (EU) 2023/915 as regards maximum levels of deoxynivalenol in food

NEW Maximum level for Deoxynivalenol – 1500 µg/kg

- Detection percentage (>LOQ), %
- ≥ 1500 (EU limit), %
- ≥ 1000 (China limit), %





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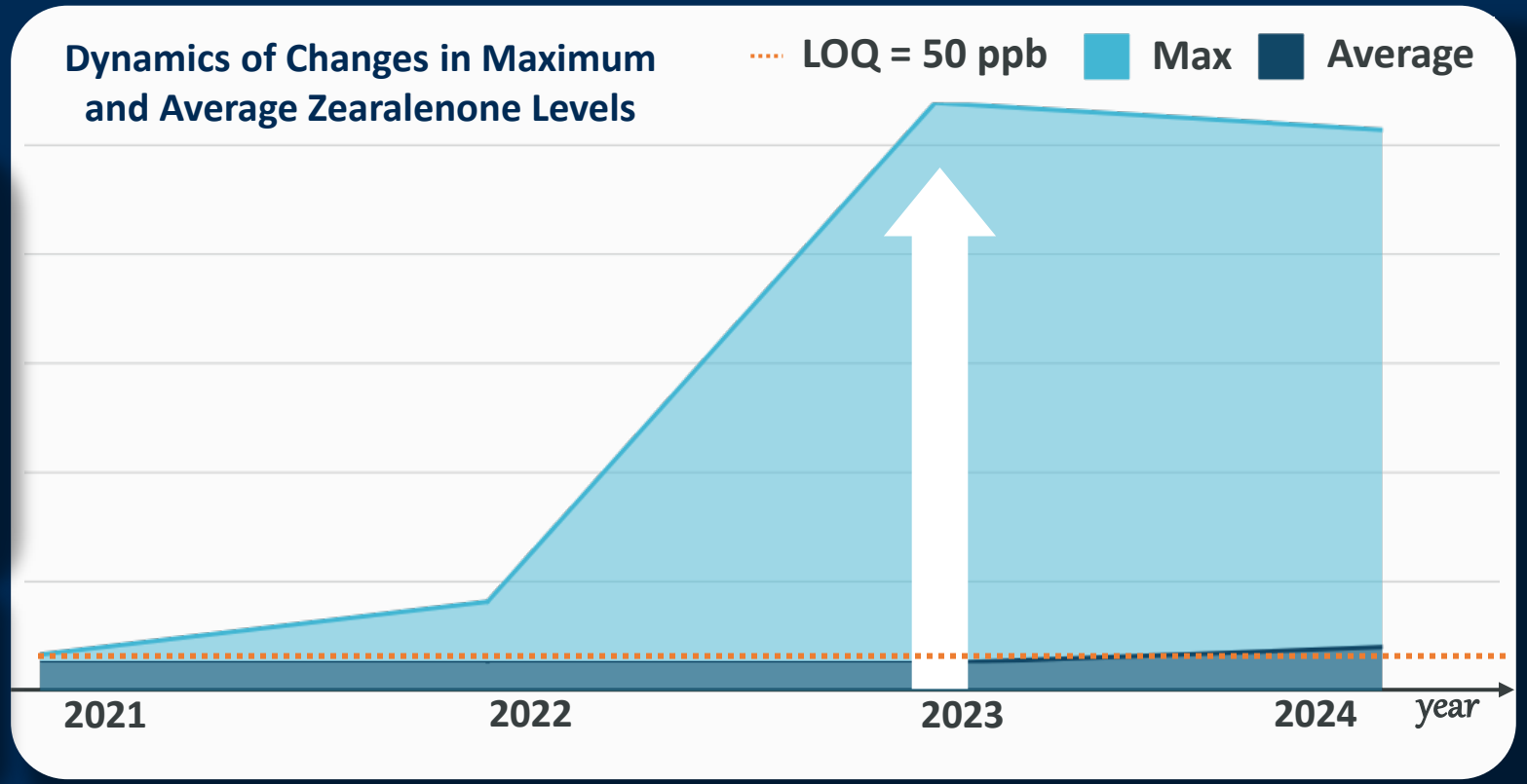
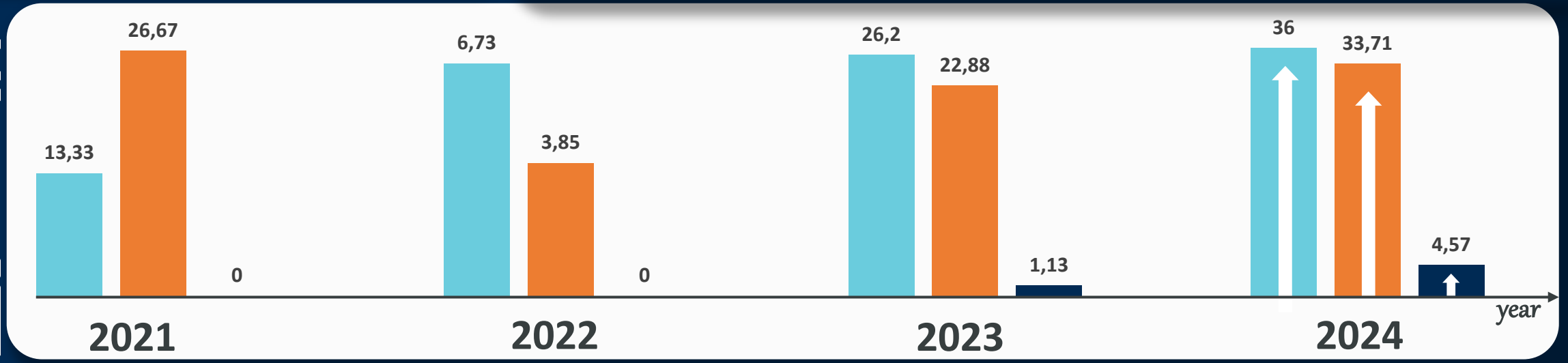
COMMISSION REGULATION (EU) 2023/915
of 25 April 2023
on maximum levels for certain contaminants in food and repealing Regulation (EC) No 1881/2006

Maximum level for Zearalenone – 350 µg/kg

- Detection percentage (>LOQ), %
- ≥ 350 µg/kg (EU limit), %
- ≥ 60 µg/kg(China limit), %





Percentage of detected pesticides in specified products

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SB 01.01-31.12.2023

Pirimiphos methyl

Metalaxyl

10 %

SB 01.01-20.12.2024

Imidacloprid

7 %

SFSO 01.01-31.12.2023

Chlorpyrifos 68%

Pirimiphos-methyl 25%

Metalaxyl 15%

Malathion, Thiamethoxam >5%

SFSO 01.01-20.12.2024

Metalaxyl 22%

Thiametho-xam 8%

Ethiprole, Fludioxonil, Clothianidin >2%

Percentage of detected pesticides in specified products

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Wheat 01.01-31.12.2023

- Pirimiphos - methyl: 27 %
- Chlorpyrifos: 6,7 %
- Piperonyl butoxide, Fipronil, Malathion, Metalaxyl: <1 %

Wheat 01.01-20.12.2024

- Pirimiphos - methyl: 28 %
- Chlorpyrifos: 1,5 %
- Malathion: 1 %

Corn 01.01-31.12.2023

- Pirimiphos-methyl: 5 %
- Biphenyl: 2 %
- Malathion, Metalaxyl: <1 %

Corn 01.01-20.12.2024

- Malathion: 3 %
- Pirimiphos- methyl: 1 %

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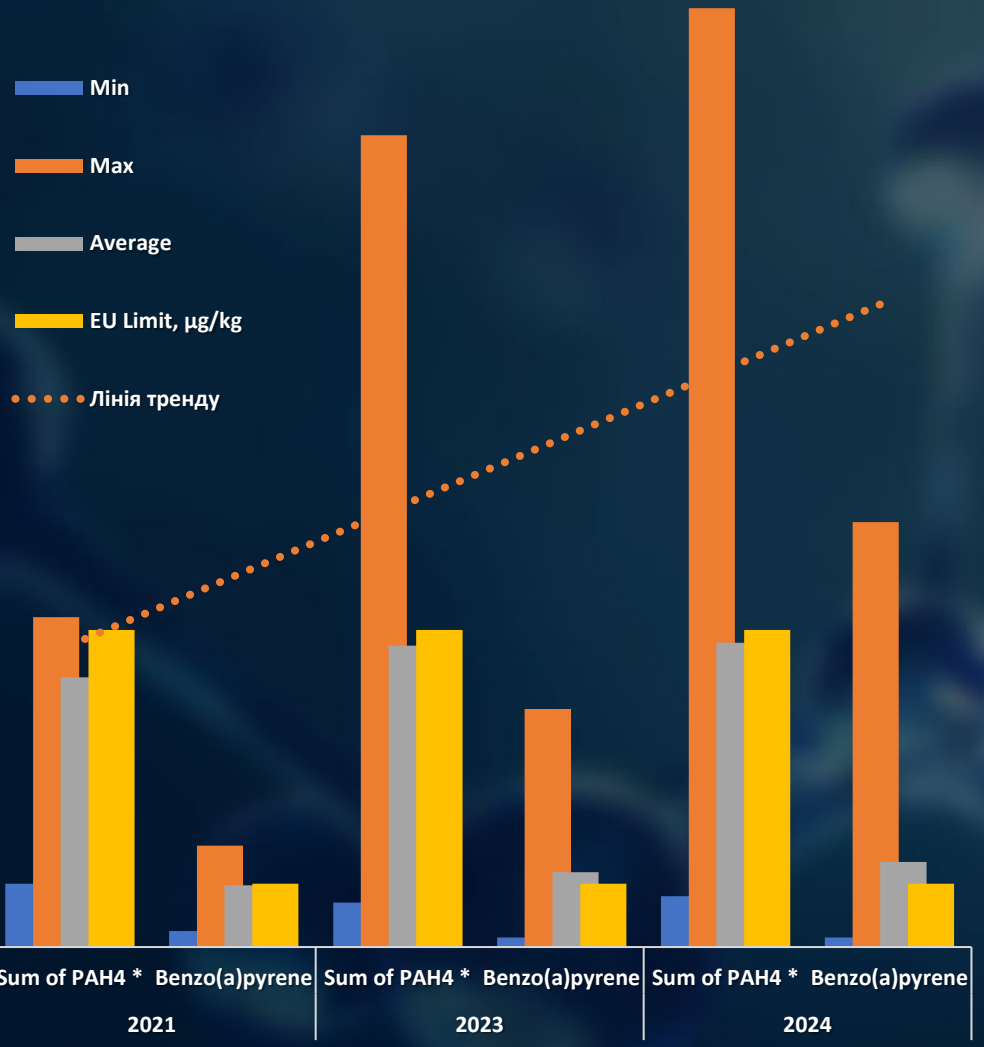
SFSO



A trend of increasing PAH content compared to the pre-war period

Average values – Sum of PAH4 are higher by

12.9 %

Average values Benzo(a)pyrene Are higher by

37.4 %

The maximum content of PAH4 and Benzo(a)pyrene has increased in:

2.8 times

PAH4

4.2 times

Benzo(a)pyrene

*Sum of benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and chrysene

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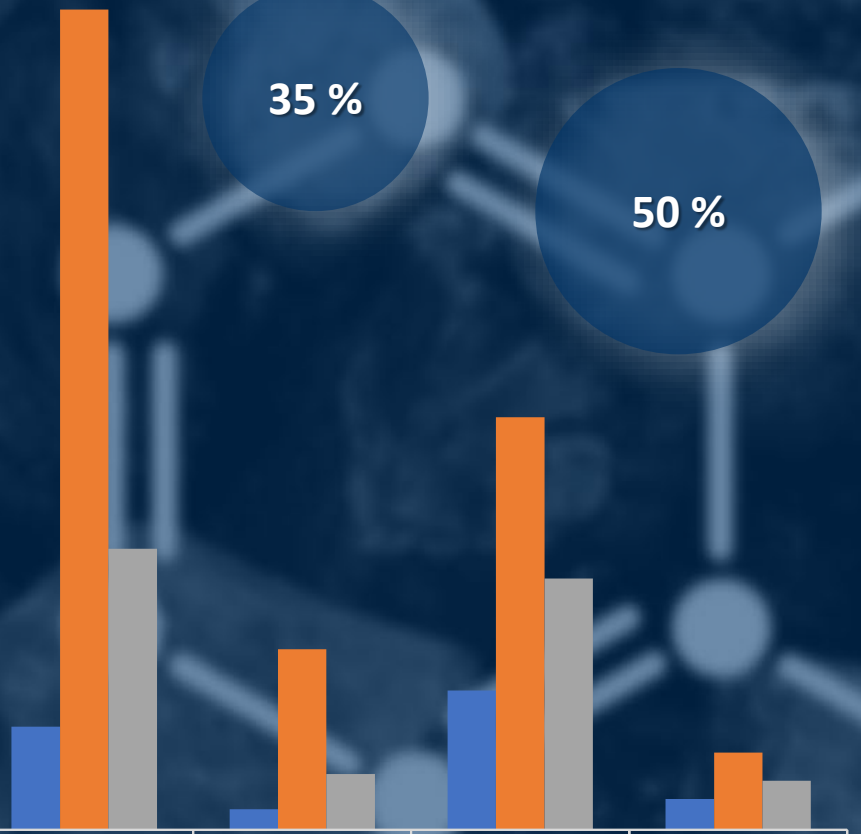
A trend of increasing content PAH

35 %

50 %

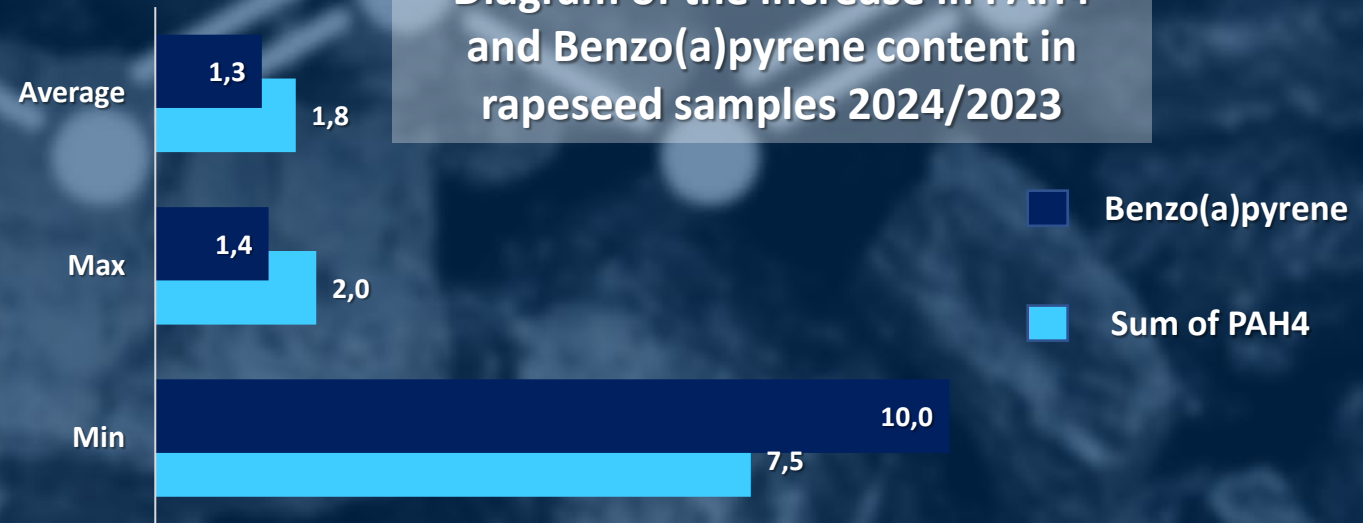


SBO

	2023 Sum of PAH4 *	2023 Benzo(a)pyrene	2024 Sum of PAH4 *	2024 Benzo(a)pyrene
Min	2,00	0,40	2,70	0,6
Max	15,90	3,50	8,00	1,5
Average	5,45	1,08	4,87	0,95

RPS

Diagram of the increase in PAH4 and Benzo(a)pyrene content in rapeseed samples 2024/2023



A stable trend in heavy metal analysis

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< 0.05* in others years

WHEAT	Heavy metals, ppm 2023 year	
	Arsenic (As)	Lead (Pb)
Min	< 0.05*	< 0.05*
Max	0.12	0.08
Average	< 0.05*	< 0.05*

As – Arsenic

Pb - Lead

A stable trend in heavy metal analysis

CONTROLUNION AGMINTEST

CORN	Heavy metals, ppm							
	2021			2023				2024
	Arsenic (As)	Copper (Cu)	Lead (Pb)	Iron (Fe)	Zinc (Zn)	Copper (Cu)	Lead (Pb)	Iron (Fe), Zinc (Zn), Copper (Cu), Lead (Pb), Arsenic (As)
Min	< 0.05*	0.57	< 0.05*	15.16	11.37	0.96	< 0.05*	< 0.05*
Max	0.10	1.49	0.20	19.43	15.46	1.28	0.08	< 0.05*
Average	< 0.05*	0.89	< 0.05*	16.85	12.94	1.11	< 0.05*	< 0.05*

As – Arsenic

Zn - Zinc

Cu - Copper

Fe - Iron

Pb - Lead

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A stable trend in heavy metal analysis

SFSO

	Heavy metals, ppm								
	2021			2023			2024		
	Iron (Fe)	Zinc (Zn)	Copper (Cu)	Iron (Fe)	Zinc (Zn)	Copper (Cu)	Iron (Fe)	Zinc (Zn)	Copper (Cu)
Min	0.36	< 0.05*	< 0.05*	0.09	0.11	< 0.05*	< 0.05*	< 0.05*	< 0.05*
Max	2.84	< 0.05*	0.12	5.65	1.94	0.21	4.64	0.80	0.055
Average	1.25	< 0.05*	< 0.05*	1.02	0.49	0.02	0.42	0.23	< 0.05*

Cd - Cadmium

As – Arsenic

Zn - Zinc

Cu - Copper

Pb - Lead

Fe - Iron

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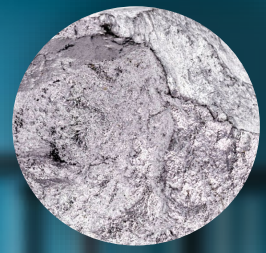
A stable trend in heavy metal analysis

No exceedances were detected



Cd - Cadmium

Fe - Iron

As – Arsenic

Zn - Zinc

Cu - Copper

Pb - Lead

SFS	Heavy metals, ppm								
	2021			2023			2024		
	Cadmium (Cd)	Lead (Pb)	Arsenic (As)	Cadmium (Cd)	Lead (Pb)	Arsenic (As)	Cadmium (Cd)	Lead (Pb)	Arsenic (As)
Min	< 0.05*	< 0.05*	< 0.05*	0.053	< 0.05*	< 0.05*	0.08	< 0.05*	< 0.05*
Max	< 0.05*	< 0.05*	< 0.05*	0.20	0.11	0.07	0.22	< 0.05*	< 0.05*
Average	< 0.05*	< 0.05*	< 0.05*	0.11	< 0.05*	< 0.05*	0.12	< 0.05*	< 0.05*

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Absence of an increasing trend in dioxin content

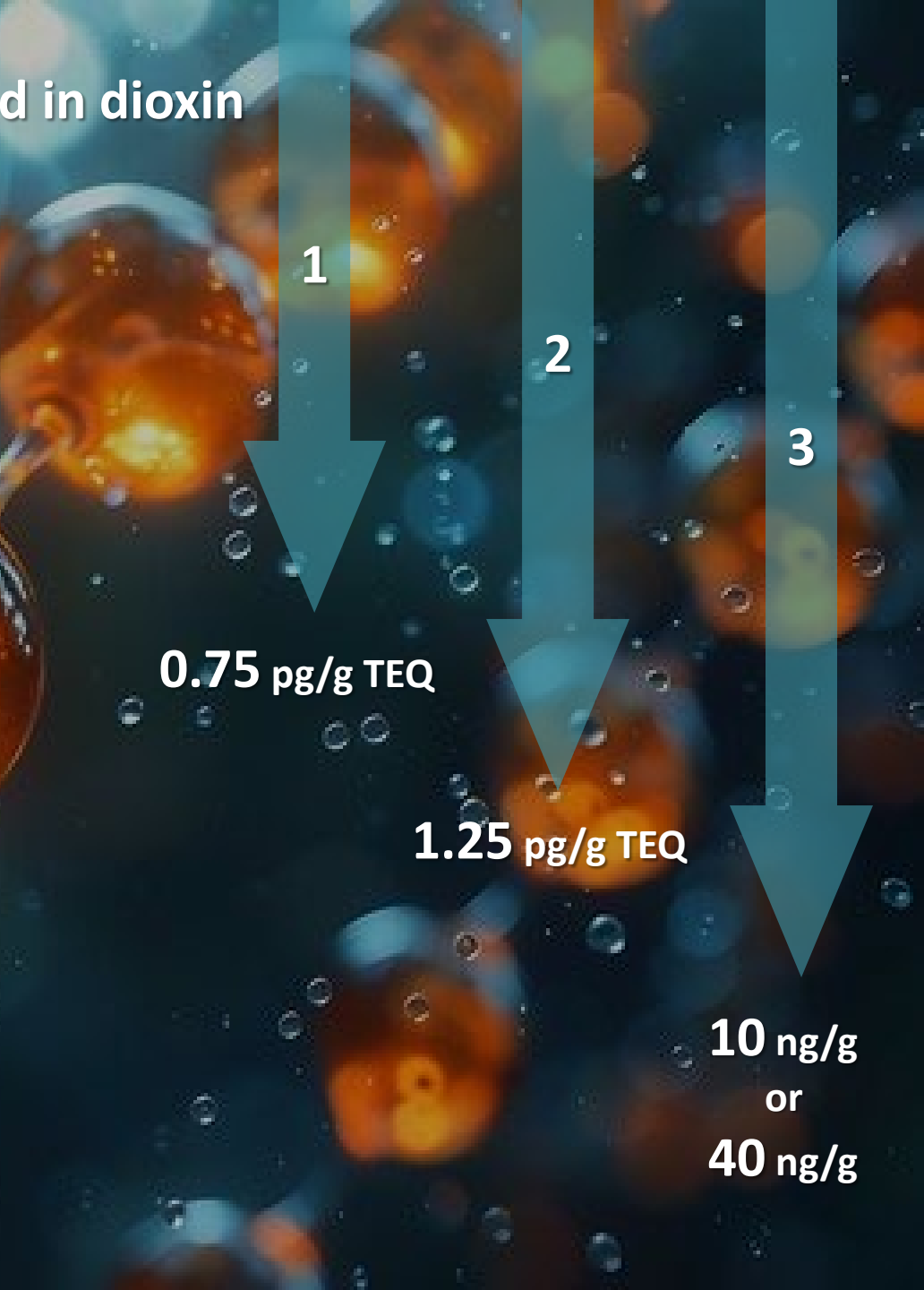
Dioxins are extremely persistent compounds

1. Sum of dioxins (WHO-PCDD/Fs-TEQ) relative to 12.0 % moisture.

2. Sum of dioxins and dioxin-like PCBs (WHO-PCDD/Fs-PCB-TEQ) relative to 12.0 % moisture.

3. Sum of PCBs non-dioxin-like relative to 12.0 % moisture.

They are usually present in very low concentrations, but even at such levels, they can be extremely toxic.



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IMPACT OF WAR ON THE AGRICULTURAL SECTOR & ADAPTATION OPPORTUNITIES *(CONCLUSIONS)*

Farmers

- Increased production costs (land decontamination, demining, agrochemicals)
- Reduction of available agricultural land
- Seeking alternative cultivation methods

Sellers

- Higher expenses for logistics, certification, and quality control
- Changes in export markets and demand for eco-friendly products

Adaptation Opportunities

- Implementation of advanced soil purification technologies
- Access to international grants and investments
- Strengthening market positions through quality improvement (Expansion of the List of Controlled Product Safety Indicators)

Final Message

- The war is reshaping the agricultural sector, but adaptation and innovative approaches will help ensure the stability and competitiveness of Ukrainian products.

100 +
YEARS OF THE COMPANY PETERSON AND CONTROL UNION

70 +
COMPANIES IN THE GLOBAL NETWORK

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LAB OPPORTUNITY

- Analysis of quality and safety indicators.
- Providing training and webinar sessions on a wide range of subjects, tailored to learners of various proficiency levels.
- Preparation of grain and oilseed samples with known quality indicators of various ranges.
- Research and development activities on current quality issues, including monitoring and analysis of the quality of the new harvest.
- Publisher of reference books and instructional materials.

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COMMODITIES

CEREALS, LEGUMES, OILSEEDS, AND THEIR PROCESSED PRODUCTS

AGRICULTURAL CROP SEEDS

FOOD PRODUCTS

SUGAR

CONTROLUNION
AGMINTEST

150 +
ASSESSMENTS IN THE SCOPE OF ACCREDITATION

20 +
YEARS OF AGMINTEST LABORATORY EXPERIENCE

10 +
OBJECTS (PRODUCTS) SUBJECT TO ACCREDITATION

ACCREDITATIONS

GAFTA membership since 2002.

FOSFA membership since 2004.

ДСТУ ISO 17025 and **ILAC** accreditation since 2011.

GMP + accreditation since 2024.

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ДЯКУЮ !

Контрол Юніон ДП «Агмінтест»
Control Union SC Agmintest

Лабораторні послуги | Laboratory Services

Odesa, 65036, Ovidiopol road 3

agmintest@controlunion.com

Phone: +38 066 158 51 04 ; +380 99 067 31 29