



Assessment of irregularities in organic imports from Ukraine to the EU in 2016, notified in OFIS



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I. Objective of the study

The aim of the study is to improve the understanding of irregularities indicated by pesticide residues in organic product imports from Ukraine into the EU that were reported in the European Commission's Organic Farming Information System (OFIS) in 2016. On the basis of the analysis, some recommendations are derived which are directed towards actors along the organic supply chains originating in Ukraine, certification bodies (CBs) operating in this region as well as the competent authorities in the EU and other export destinations.

2. Rationale

Considerable production potential and long, complex supply chains

In Ukraine around 400'000 ha of agricultural land and 530'000 ha of wild collection area were organically certified as of 2016. The organic certified area has been increasing steadily, especially in the last five years. The organic sector is dominated by arable crop farms and 81% of the total organic surface area is arable land. Wheat, sunflower seeds, corn and spelt are the most important crops. Eighty percent of the organic crop production in Ukraine is exported, mainly to Western Europe (Trofimtseva, 2017). The main export countries are The Netherlands, Germany, Great Britain, Switzerland and Italy.

Long and complex trade chains are typical for imports from Ukraine to Western Europe (as illustrated in Figure 1). Hence, a bigger number of hazard points for contamination and comingling have to be considered. And, due to the mostly large volumes which are traded, any irregularity detected in one lot can potentially affect organic operators in many countries

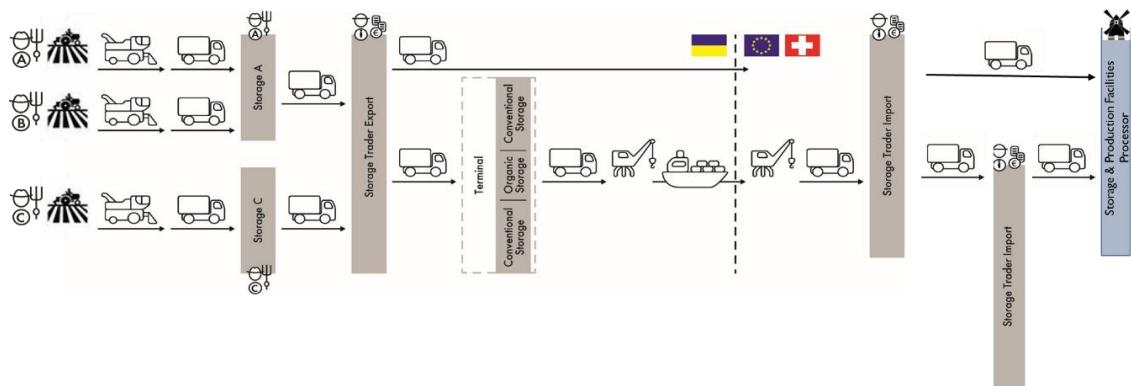


Figure 1: Typical organic supply chains from Ukraine to Western Europe

Two typical organic export supply chains from Ukraine are described in the following text block. These two cases of export highlight different sets of points along the value chain in which a contamination with unauthorized substances may occur.

2 typical Ukrainian organic supply chains (SC)

The direct supply chain - SC1:

Organic Producer A transports his harvest to his own warehouse / silo. From there, the traded lot is loaded into big bags and transported by an external logistic company to the storage cell of an importer (trader or processor) in Western Europe. There, the lot is processed in the importer's own processing unit or re-sold to another trader or to a processor.

The complex supply chain - SC2:

Organic Producer B brings his harvest to the warehouse / silo of Organic Producer A. Both producers have contracts with a Ukrainian trader. From the producer storage facility, the lots are picked up by trucks, which bring the lot either to an intermediate warehouse or directly to a terminal. This terminal could consist of different and physically separated conventional and organic storages. Trucks with organic and conventional lots from different exporters arrive at the storage daily. Sometimes, lots are moved from one warehouse to another at the terminal. From the terminal, the lot is picked up by terminal trucks and loaded on barges or containers as bulk. The traded lots are shipped via vessels to the destination harbour. After unloading the vessel, the lot is transported by trucks or train carriage to the storage of the importer and from there to further trader storages (incl. export to traders in other countries). Finally the products, are delivered via trucks to the final processor.

Especially in complex supply chains such as SC2, there are multiple risk areas along the value chain where contamination can occur.

Ukraine declared as so-called "Risk Country" and the consequences for inspection and certification

In 2014, a large pesticide residue case troubled and affected the organic sector in the EU member states. A large lot of organically certified sunflower cake imported into the European market through a complex value chain contained pesticide residues. As a consequence, Ukraine and other big organic producer countries with complex supply chains from Eastern Europe were declared as "risk countries" by the EU Commission. Special import guidelines were launched in 2016 for sourcing organic commodities from countries with risky supply chains, including Ukraine.

The EU Commission guidelines refer to the following product groups:

- Cereals;
- Products of the milling industry; malt; starches; inulin; wheat gluten;
- Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder (including sunflower seeds);
- Residues and waste from the food industries, prepared animal fodder (including oil cake and other solid residues, whether ground or in the form of pellets, resulting from the extraction of vegetable fats or oils).

However, it does not refer to the product group of berries, which frequently contains pesticide residues as well.

At the end of both 2016 and 2017, the situation was reassessed and it was decided that additional official controls implemented by the EU Member States' competent authorities on organic products imported from these countries would be continued. These controls are carried out in accordance with the revised "Guidelines on additional official controls on products originating from Ukraine, Kazakhstan and Russian Federation"¹.

The guidelines further state that at least one representative sample shall be taken of each of the consignments at the point of entry into the EU. Sampling shall be done by using the official sampling methods used for the control of feed as described in the Commission Regulation (EU) No 691/2013 - These samples shall be again analysed for the presence of pesticide residues in an accredited laboratory. Whenever pesticide residues are detected, an investigation shall be started and a notification in the Commission's Organic Farming Information System (OFIS) shall be made.

The EU further urges the certification bodies that are active in Ukraine to carry out additional control activities such as unannounced inspections and other measures to safeguard and enhance the quality assurance along organic supply chains, e.g. lab analysis of traded goods for export. The import guidelines further recommended that additional samples be taken of the crops on the field during the vegetation period to better assess if unauthorised substances were used (especially on those farms, which have been rated as high risk operators by the CBs).

Controls of the product flow along the supply chain play a fundamental role. They are carried out in order to ensure that products meet the relevant standards, that there is a level playing field and fair competition for operators, and that products meet consumers' expectations. Controls are conducted in order to prevent, detect or follow-up on irregularities/infringements (hereinafter "irregularities").²

Irregularities can be caused by

1. fraud as an intentional act on all levels of the supply chain,
2. unintentional wrong labelling,
3. unintentional comingling of organic lots with conventional lots (e.g. during transport or storage),
4. contamination with unauthorised substances on the field (drift), during transport or storage, and
5. persistent chemicals in the soil, which lead to a contamination of the crop.

Organic Farming Information System (OFIS)

¹https://ec.europa.eu/agriculture/organic/sites/orgfarming/files/guidelines_addoffctrl_ukraine_russian_federation_and_kazakhstan_final.pdf.

² European Commission (2017): Annual Report on EU irregularities (2016) to the Committee on Organic Production

After the import guidelines entered into force, an increased number of pesticide residue cases in Ukraine has been notified in OFIS in 2016.

Against this background, this study aims to assess the root causes of Ukrainian irregularities, as notified in the OFIS. The analysis of OFIS notified irregularities could form an important part of a management information system that enables authorities and operators to be aware of risks immediately as they arise.

It must be mentioned, that all food lots exported from Ukraine are analysed for pesticide residues. Only if no pesticide residues are found, a certificate of inspection is issued by the exporter CBs working in Ukraine. An OFIS notification occurs only when an irregularity, not previously detected by the exporter CB in Ukraine, is first detected when the product reaches the import country.

3. Methods

This study primarily focuses on the irregularities detected in Ukraine and recorded in OFIS. The following sources and studies were used in this analysis and help to analyse the cases notified in OFIS in 2016 and the nature of irregularities in Ukraine from different perspectives:

- Information from the EU commission about OFIS notified residue cases in 2016 in which Ukrainian exporters were involved,
- The report of the EU commission on all OFIS cases in 2016,
- The results of a survey carried out with CBs operating in Ukraine,
- Detailed information about OFIS cases from two concerned exporter CBs, and
- The results of dust analyses in storages of customers of two CBs operating in Ukraine.

4. Results

4.1 Overview of OFIS notified cases in 2016 on the EU level

The following overview of the allocation of all total OFIS cases in the EU in 2016 puts the number of notified OFIS cases from Ukraine (26 cases) in perspective and helps evaluate if this number is average or above average.

Since 2010, the total number of notified irregularities have increased fivefold, with a total of 398 cases reported in OFIS in 2016 (see European Commission, 2017 / Figure 2). The rapid increase in the number of cases can be due to several reason: the increased number of residue analyses that were done, more sensitive measurement equipment detecting lower levels of residue, improved controls, and better compliance with reporting requirements. Additionally, the increase could be due to general growth in the organic sector, with more product being traded and more samples analysed. It should be noted, however, that the increase is also due to the use of the OFIS modules to first report on irregularities concerning imported products that were in free movement in the EU.

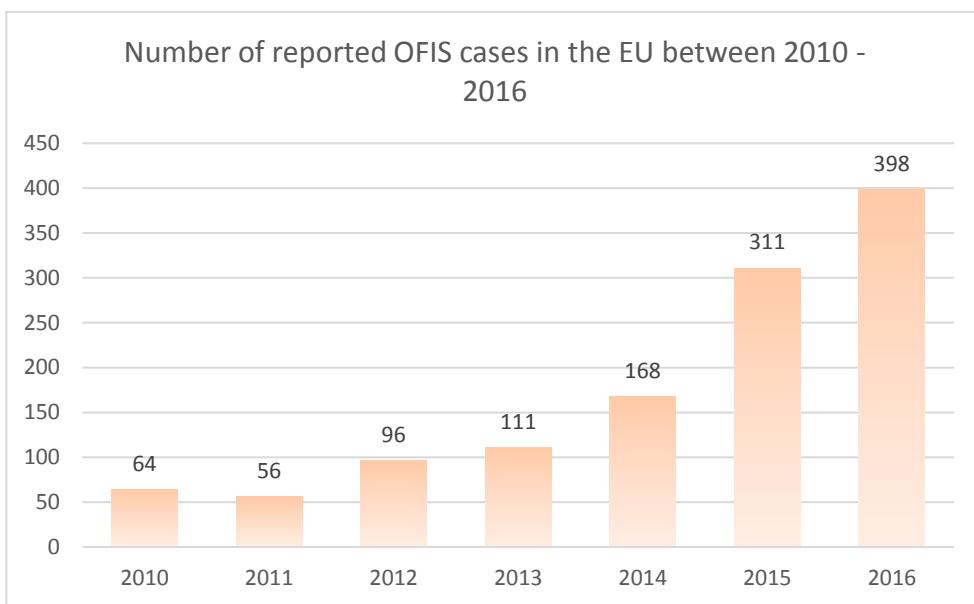


Figure 2: Number of OFIS cases in the EU between 2010 – 2016; Source: EU commission, 2017

In 2016, most irregularities were notified by Italy, The Netherlands and Germany. About 30% of all notifications were related to products originating from Third Countries. In the case that where EU-origin was reported at first hand, it was later found out that the product originated from a Third Country.

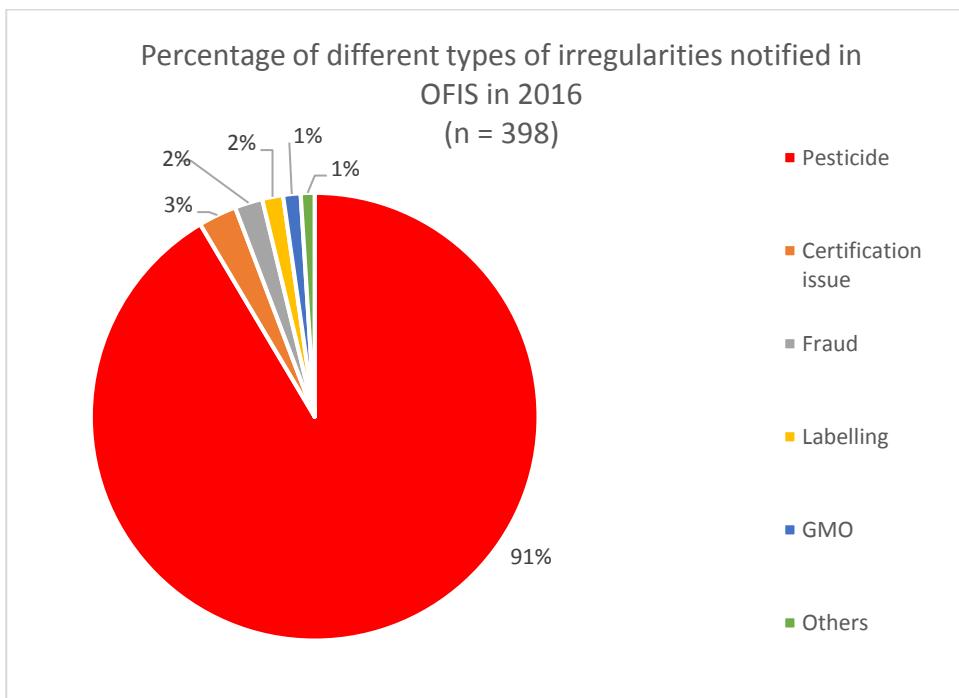


Figure 3: Allocation of detected irregularities, notified in OFIS in 2016; Source: EU commission, 2017

The majority of irregularities (91%) are related to pesticide residues detected in the traded lots. Other cases are related to failures in certification, misleading or wrong labelling and traces of GMO. In 6 cases (2%), fraud was assumed as reason for a notification (see Figure 3).

The product categories primarily affected were fruits, vegetables/mushrooms, cereals and herbs.

About 40% of the pesticide residue cases involved 2 or more substances (in some cases, up to 18 substances) and often high levels of these residues were measured. Pesticides which are not allowed at all in the EU, even in conventional farming, were also detected.

According to the EU commission, root causes for the irregularities could not be identified in 82% of all OFIS cases, even despite the fact that the CBs involved requested investigations to be carried out.

OFIS cases from Third Country imports in 2016 most frequently originated in China, Turkey, Egypt, Ukraine and India (see Figure 4).

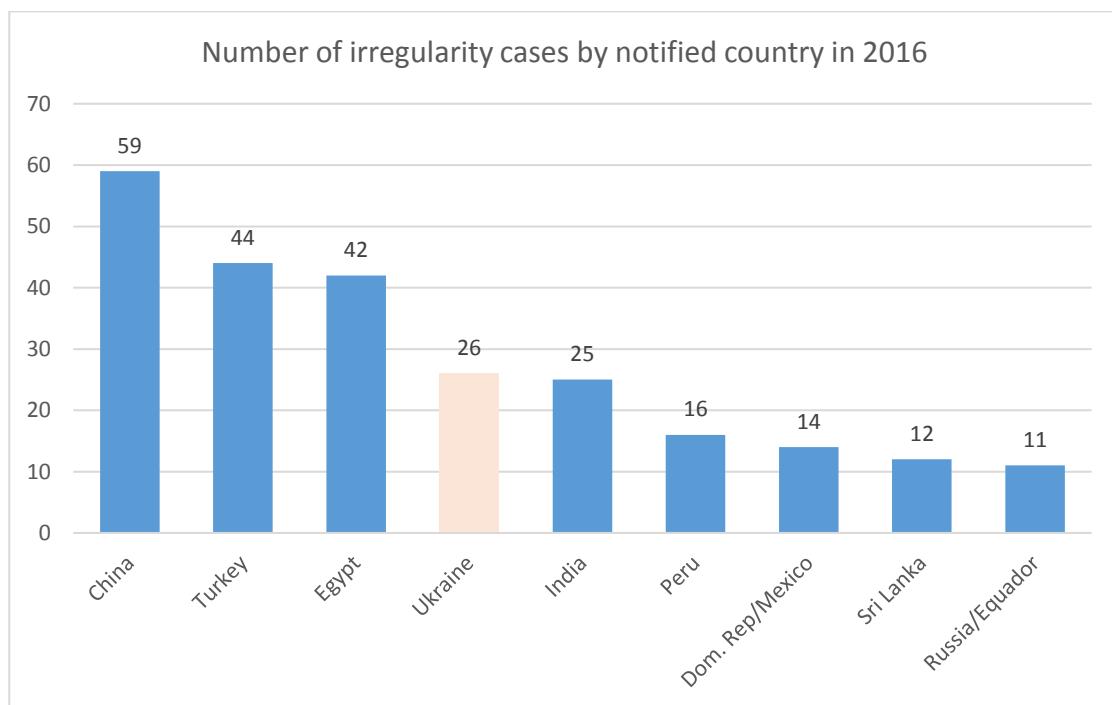


Figure 4: Number of irregularity cases by notified country in 2016; Source: EU commission, 2017

4.2 Overview of OFIS notified cases in 2016 from Ukraine

In 2016, 26 cases reported in OFIS indicated Ukraine as a notified country (see Figure 4).

Apart from one exception, all notified OFIS cases from Ukraine indicated irregularities due to pesticide residues, mostly because of 1 substance detected. In 28% of the cases, two or more substances were detected (compared to the average of 45% of all OFIS cases on EU level that involved 2 or more substances). Only in a few cases were high levels of contamination reported.

Figure 10 illustrates the product groups affected in the 26 cases reported. The highest rate of pesticide residue was found in rapeseeds, sunflower seeds and wheat (together accounting for around half of all cases).

All the cases notified in OFIS from the import countries had a valid certificate of inspection as transaction certificate as a pre-condition for export. To receive this certificate, lab analysis prior to export of the lot in question must indicate negative results. The EU recommends this procedure to be carried out for imports from Ukraine and other Third Countries in order to hold back product with positive residue analysis results before it is exported.

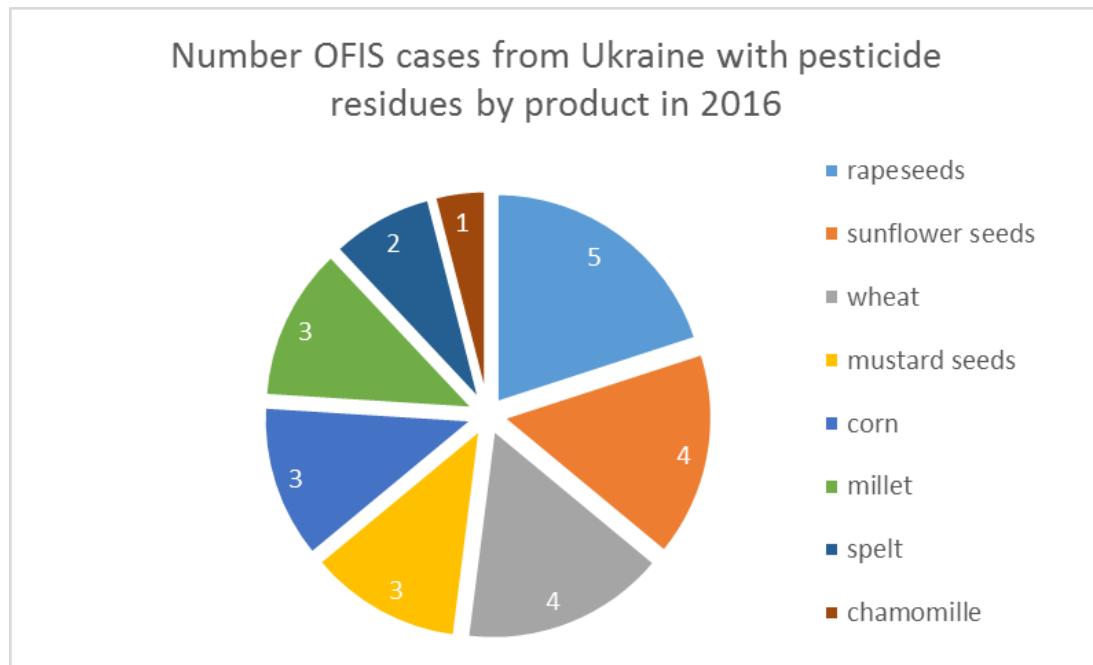


Figure 5: Number of OFIS cases from Ukraine with pesticide residues by product in 2016;
Source: EU commission, 2017

Table 1 provides an overview of all detected substances reported in the 2016 OFIS cases from Ukraine. The substances Chlorpyrifos/Chlorpyrifos-methyl (6 times) and Pirimiphos-methyl (5 times) were most frequently detected. All other substances were detected a maximum of one or two times.

Chlorpyrifos/Chlorpyrifos-methyl and Pirimiphos-methyl are often used to control storage pests. Treatments with these substances for other purposes cannot be excluded, regardless of the fact that this may not be currently authorized by the EU. Table 3, therefore, also indicates other areas these substances could be potentially be used in.

Glyphosate, Chlormequat, Mepiquat and Pymetrozine are 4 pesticides that were detected, indicating a treatment on the fields. The assumed root causes for the residues of these pesticides as well as other of other substances detected will be discussed further on in this report.

Table 1: Overview of all detected substances reported in the 2016 OFIS cases from Ukraine

Substance	No. of cases with substance detected in OFIS cases in Ukraine 2016	Substance category	Potential scope of application					
			Field use	Seed treatment	Storage	Household	Timber protection	Veterinary
Chlorpyrifos / Chlorpyrifos-methyl	6	Insecticide, acaricide	x	x	x	x	x	x
Primiphos-methyl	5	Insecticide	(x)	x	x	x		x
Bifenthrin	2	Insecticide, acaricide	x	x	x		x	
Imidacloprid	2	Insecticide	x	x			x	x
Propiconazole	2	Fungicide	x				x	
Cyproconazole	2	Fungicide	x				x	
Glyphosate	2	Herbicide	x					
Chlormequat	2	Plant growth regulator	x					
Mepiquat	2	Plant growth regulator	x					
Cypermethrin	1	Insecticide, acaricide	x	x	x	x	x	x
Diazinon	1	Insecticide, acaricide	(x)	x	x	x	x	x
Malathion	1	Insecticide, acaricide	x		x			
Pymetrozine	1	Insecticide	x					

X = most likely usage; x = usage cannot be excluded; (x) = usage not likely, but theoretically possible

Sources: EU commission, 2017 and own assessment

4.3 Survey among certification bodies

In July 2017, all certification bodies operating in Ukraine were contacted and asked to provide information about OFIS cases, they were involved with as an exporter CB. They were also asked about all residue-related irregularities of their Ukrainian operators in the year 2016. Lastly, they were asked to inform on the analysis results of samples taken during the production season (leaf samples) and before export.

The aim of the survey was to gain a better understanding of the situation concerning cases of suspected residue with organic products from Ukraine as well as the results of samplings in the field and before export. Based on this analysis, potential risk factors that could lead to irregularities were identified. Four certification bodies, which together certify 80% of the total organic area in Ukraine, responded to the survey. The data they provided, therefore, allow for a representative picture of the situation in 2016 with respect to the findings and assessment of from a CB point of view.

Sampling to detect potential residues of unauthorised substances

Table 2 below indicates the aggregated number of samples taken by the four CBs in 2016 and the respective lab results.

Altogether more than 1'000 samples were taken by the four CBs before export or during the production season. In 19% of all samples, residues of unauthorised substances were detected. The details of the lab analysis are shown in tables 2 – 4.

Table 2: Aggregated number of product samples taken and analysis by CBs in Ukraine in 2016, according to survey

	Number of samples taken	Number of samples, in which prohibited substances were detected	Number of downgrades to "conventional" of concerned crops/plots
Sampling <u>in total</u> (2016)	1'028	199	73
Leaf samples during the growing season (2016)	226	77	39
Dust samples in storage and/or processing facilities (2016)	17	17	-
Samples of final products harvested (prior to export) (2016)	747	80	13

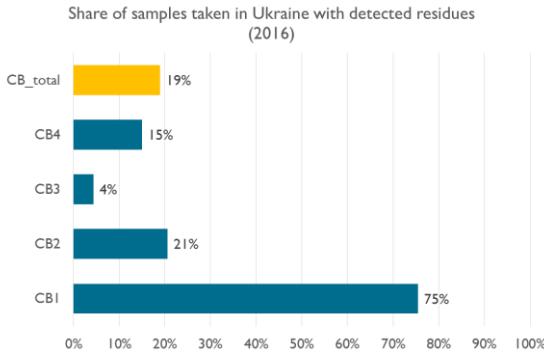


Figure 6: Share of all taken samples with detected residues

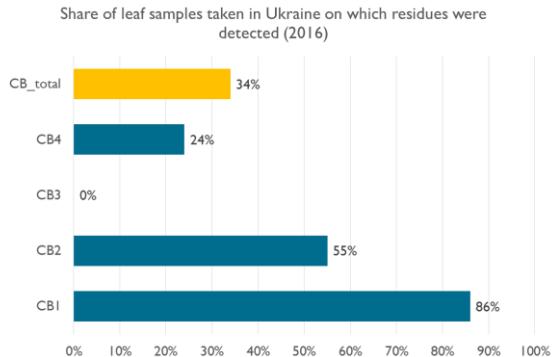


Figure 7: Share of leaf samples with detected residues

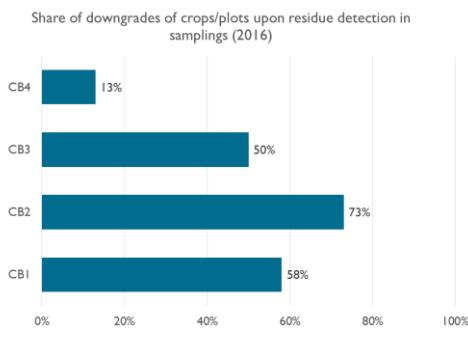


Figure 8: Share of downgrades of crops or plots upon residue detection in samplings

It is especially difficult to interpret the very heterogeneous results among the four CBs in the survey. The responses from the CBs suggest that some CBs clearly take more samples as others during the production season.

Possible root causes of OFIS notified cases

The four CBs that responded to the survey were involved in 25 out of total 26 OFIS cases in Ukraine in 2016. The CBs were asked about the likely root causes of the notified irregularities they need to declare to the EU commission. Two certification bodies stated that they were only able to identify the root causes in less than 25% of the OFIS cases. The other two CBs state that in 50-75% of the cases, the likely root cause could be identified. These answers suggest that in a significant number of cases the true reasons of irregularities remain unclear, even after the case was investigated. This means basically that some decisions to certify or downgrade lots were taken on the basis of uncertainty.

Figure 9 presents the answers of the CBs with regard to the assumed root causes of the OFIS cases the surveyed CBs were involved with in 2016. The results indicate that 14 out of 25 cases were

The survey responses of the four CB illustrate significantly differences in the results of sample analysis. While one CB reported pesticide residues in 75% of all samples, another CB only detected residues in 4% of the samples (see Figure 6). Pesticide residues were detected in an especially high number of the leaf samples analysed (86%) (Figure 7). Three out of four CBs had to downgrade at least half of the crops or plots (fields), where residues were detected. (Figure 8).

related to contaminations in the storage or during the transport. Comingling (4 cases) and spray drift from neighbouring farms (3 cases) represent further relevant root causes.

Mostly wheat, sunflower seeds or cake, barley and rapeseed were the concerned crops in the notified OFIS cases.

Likely root causes of Ukrainian OFIS cases in 2016

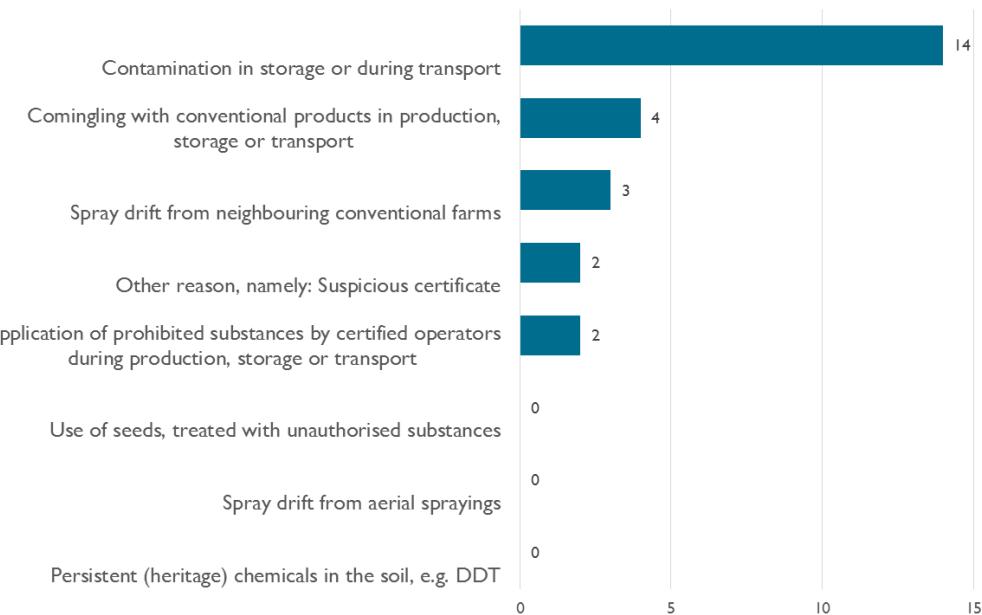


Figure 9: Likely root causes of 25 OFIS cases in Ukraine in 2016 (n= 4 CBs)

The CBs were also asked to show on a diagram of a typical complex export value chain, where they assume the most relevant hazard points for contamination or comingling to be and then to explain the reasons for their answers. Figure 10 illustrates where these dots were placed.

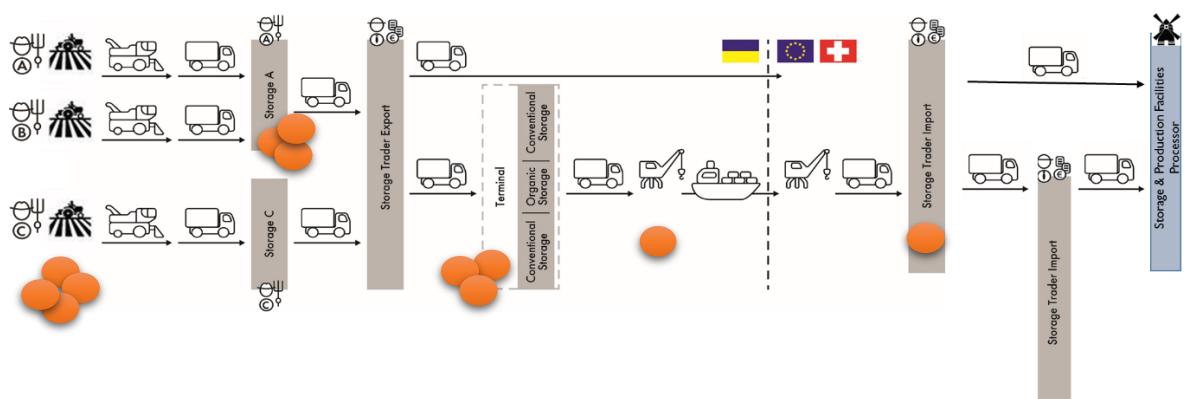


Figure 10: Main hazard points for contamination and comingling as assumed by the CBs interviewed

According to the CB assessment, the field (application of noncompliant substances or spray drift), the storage of the producer (especially when storing crops from different farms) and the harbour terminals are assumed to be the most relevant hazard points of contamination and comingling.

Additionally, the authors of the study asked the CBs to rate the relevance of possible root causes in Ukraine, based on their own observations. The results of this question are presented in table 3.

Accordingly to the assessment of the interviewed CBs, most reasons were rated as relevant or highly relevant, particularly with regards to the spray drift from neighbours and airplanes and the contamination in storage and during the transport.

*Table 3: Most relevant root causes of positive lab analysis results in Ukraine in 2016
(scale: 1 = not relevant to 6 = highly relevant)*

Causes for positive analysis results	Rating (average)
Spray drift from neighbouring conventional farms	5,5
Spray drift from aerial sprayings	4,5
Contamination in storage or during transport	4,5
Comingling with conventional products in production, storage or transport	4,2
Application of prohibited substances by certified operators during production, storage or transport	3,8
Use of seeds that were treated with unauthorised substances	3,2
Persistent (heritage) chemicals in the soil, e.g. DDT	2,8

Explanations given by the interviewed CBs for their assessment of risk areas:

- **Contamination on the fields:** The following different sources of contamination on the farm level were identified: (i) the intentional or unintentional use of noncompliant products, (ii) contaminated soil or air, (iii) drift from neighbouring fields where pesticides not permitted in organic agriculture were applied, even though a buffer area existed, and (iv) unintentional mixing-in of crops grown in buffer areas, even when clearly separated harvest and storage solutions for organic and conventional are in place.
- **Contamination in storages:** Whenever staff uses substances in storage facilities (e.g. pest treatment after regular cleaning) without knowledge or permission of the operator management, contamination with these substances can occur. As sometimes storage facilities are not properly cleaned after storing a conventional product, the organic product may come in contact with prohibited substances. Storage facilities or transport infrastructure which are used exclusively for organic products would be ideal, but they are not yet common and widely available in Ukraine.

- **Contamination at the terminals:** Terminals are usually places of turn-over for many different types of product with different kinds of quality, belonging to many different companies. Even if essential precautionary measures are taken by operators, something could be overlooked. Due to this complexity of activity at terminals, it can often be very difficult to identify any source of contamination that may have occurred there.
- **Contamination during loading to (shipping) vessel from vehicles:** The use of conveyor belts, vehicles and storage containers that are contaminated with prohibited substances represent a potential source of contamination during loading. Contact, comingling and unintentional mixing with non-organic product here is also easily possible.
- **Contamination during transport:** Transport (shipping) vessels and trucks represent are a permanent hazard because they are, in many cases, not used exclusively for the transport of organic products. Additionally, improper handling of organic product through staff that have not been sufficiently trained may also occur.

After having described the result of the survey done with Ukrainian CBs in Chapter 3, the subsequent chapters focus on selected cases notified in OFIS. This analysis is based on the data collected by the EU commission as well as additional information provided by two CBs operating in Ukraine.

4.4 Detailed analysis of 17 OFIS cases in 2016 from Ukraine

OFIS cases, about which FiBL obtained additional data and background information, were analysed in detail. This information was provided to FiBL by two CBs operating in Ukraine and for a total of 17 out of the total 26 OFIS reported cases from Ukraine in 2016.

As described above, all Ukrainian lots which were notified in OFIS, had valid certificates of inspection as transaction certificates and indicated negative lab results in Ukraine with regard to residues prior to export.

An analysis of these cases concludes the following potential reasons for discrepancy between the detected differences in lab analysis commissioned by the export and import countries:

- The CBs working in Ukraine and importers may use different sampling methods. A contaminated product is often distributed very heterogeneously within a given lot, so different sampling methods can lead to different results.
- Contaminations may have occurred during the transport to the warehouse of the importer (e.g. when crops are transported and delivered in bulk by trucks or vessels).
- Contaminations may have occurred during the unloading process of the importer.
- Measuring inaccuracy by one of the two operating laboratories may exist, or two labs may have different levels of detection.

The analysis of OFIS notifications and investigation procedures produced interesting findings: (See further detail in Table 10.1 in the Annex).

- In only 7 out of 17 cases, additional inspections were carried out once an OFIS notification was made. In 10 cases, the decision to certify or decertify the lot was made by the CB of the Ukrainian exporter on the basis of an additional documentary check but without an additional inspection visit.
- In 11 out of the 17 cases, it was possible to determine a likely source for the residues detected in the lots. In the remaining 6 cases, the available information did not allow for the identification of a clear cause, but only for the formulation of one or more hypotheses.
- In only one case, an intentional application of unauthorised substances was assumed to be the root cause after investigation of the exporter CB. But in this particular case, the situation remained unclear because the operator cancelled the working contract with the concerned exporter CB after receiving the results from the lab analysis. After this occurred, it was not possible to continue investigations into the source of contamination.
- The majority of the cases could be tracked back to a likely contamination during the transport or storage of the crops. But in other cases, further likely causes could not be excluded.
- In several cases, the second analysis and investigation done by the exporter CB in Ukraine after an OFIS notification was made, showed other substances than initially mentioned, were detected. This lead to unclear conclusions.
- Residues of the following substances were detected more than once in the 17 OFIS cases that were analysed in detail: Pirimiphos-methyl (detected in 4 of the cases), Chlorpyrifos (3), Chlormequat (2), Imidacloprid (2), Bifenthrin (2) and Glyphosate (2).

There are four groups of OFIS cases, which are described in the following paragraphs.

Contamination/comingling in the storage as likely reason (7/17 cases)

- In 5 cases, an improper cleaning of the storage rooms/installations after treatment was identified as the most likely reason for contamination. Four lots, contaminated with Pirimiphos-methyl, a typical pesticide used for storage treatments, were released as "organic certified" after the exporter CB carried out an additional assessment. One lot contaminated with Cypermethrin was blocked because of the general bad condition in the warehouse. Cypermethrin is not typically used for storage treatments, which is why other reasons for contamination could not be excluded in this case.
- In 2 cases, the concerned lots were most likely affected by comingling with conventional products. Both lots were decertified. Both show residues found in conventional products. A mixing with conventional products could not be excluded. The residues found were Cyproconazole, Propiconazole and Chlormequat.

Contamination/comingling during loading and transport as likely reason (4/17 cases)

- In 3 cases, a contamination on the truck, which was not cleaned sufficiently before loading, was identified as the most likely reason for the contamination. Two cases involved the same facility and the samples were taken from the last truck (a risk-based sample). In one case, only the product from the last truck was decertified because of the higher residue level. In the other case, the lot was not decertified because of the low level of detected residues.
In the third case, the substance probably originated from wood that had been transported on the same truck prior to transporting the organic product. This lot was released as certified organic after the investigation. Different substances were found: Imidacloprid, Bifenthrin and Diazinon.
- In one case, comingling with conventional products was identified as the most likely reason for the detected residues (Imidacloprid, Bifenthrin). Big bags were damaged during transport and the product was reloaded into new bags at a place where conventional products are also stored. It cannot be excluded that, on this occasion, the bags were filled up with conventional products. Therefore, the entire lot was decertified.

Discrepancies between lab results from product analysed by the export and import countries as likely reason (5/17 cases)

- In 4 cases, different results were reported in the analyses made on behalf of the exporter CB and those made on behalf of the importer. In all of these cases, the residue levels were close to the detection limit. In these cases, it cannot be excluded that the differences in results are based on a measuring uncertainty. All four lots in question were released by the exporter CB as "organic certified" after carrying out additional investigations.
- In one case involving wild collection products, the situation remains unclear. A mixture of 4 pesticide residues was detected in the sample in the EU import country (Chlorpyrifos, Prometryn, Tebuconazole, Carbendazym). The sample taken on behalf of the CB from the exporter and analysed by another lab indicated no residues of any substance. This could be due to a measurement error of the laboratory. However, other reasons such as mixing with conventional products or that some wild collectors were collected outside of the designated collection area cannot be excluded. The concerned lot was released as "organic certified" after additional investigations by the exporter CB were conducted.

Contamination in the field as a likely reason (1/17 cases)

- In this case, the available information does not allow a clear identification of the root cause. The exporter's certifier suspected an illegal application in the field and therefore decertified the lot. The residue detected was Mepiquat, a plant growth regulator. As a consequence of the investigations, the operator terminated the contract with the certification body.

In summary, in two thirds (11 out of 17) of the analysed cases, the blocked lots were ultimately released by the exporter CB as “organic certified products”, following a further investigation.

In 6 (out of 17) cases, products were decertified by the CB from the exporter. If the situation remained unclear and only a few lots were affected, only the affected lot was decertified. Usually, the CB only decertified the products in cases of intentional contamination, comingling with conventional products or improper treatment of storage facilities. Particularly in cases where samples were taken from the last truck only, products from this truck were decertified.

See the Annex for further details of all the 17 cases described above.

4.5 Dust analyses in Ukrainian storages

Since warehouses were identified as a potential source of contamination, CBs took dust samples there if an OFIS notification was made or when the warehouse history indicated there was a risk of contamination with unauthorised substances. In particular, old flat storage facilities, as are frequently found in Ukraine, were formerly used for purposes other than food harvest storage. Hence, they are considered to be potentially risky (Rossier/Bickel, 2015). Therefore, data was studied from dust sample analyses from 2016 and 2017 that were provided to the authors by 2 CBs.

CBs took dust samples for different reasons. One CB took samples only when residues were found in the crops that had been stored there while the other CB took dust samples in storages facilities where they suspected potential contamination.

Results of dust sample analysis in Ukraine

The chemical analyses of the dust samples of both CBs show that in all storages investigated, the dust contained multiple residues of different unauthorised substances. If grains are stored in such places, the contamination risk depends then on the amount of dust present in the storage. Whether contamination occurs depends on the amounts of dust present and on the potential contact of dust with the product.

One interesting result was that there was no correlation between the types of pesticides detected in the exported crops and those pesticides detected in the dust samples taken from the corresponding storage facilities, in which the crops were stored before export. Not all pesticides detected in the crops were found in the dust. Vice versa, some pesticides were detected in the dust but not in the exported crops. This illustrates the difficulty of interpreting dust samples as investigative measures for OFIS cases.

Even substances were detected that have no plausible use in a storage facility. This is particularly true for the insect repellent Diethyltoluamide (DEET) and for the herbicide 2,4-D, but also for a number of fungicides detected. A possible explanation for the presence of some residues in the dust samples is that the storage facility had been used in the past to store other goods. It is also relevant that under the dry, dark conditions found inside a storage facility, pesticides are much more persistent than on the field, and might remain present and active for years still.

One CB also tested the effect of cleaning in one storage by taking samples prior to and after a cleaning process. The analysis results of the latter still indicated residues, i.e. it has to be concluded, that it is difficult to completely eliminate residues in the dust, even with careful manual cleaning.

Combining the results of all dust samples taken by the two CBs, the following substances were most frequently detected in the samples: Phthalimide, Carbendazyme, Imidacloprid and Tebuconazole. The potential range of application of these substances is presented in Table 4 and described in the subsequent text box.

Table 4: Overview of the most frequently detected substances of the dust samples analysed

Substance	Category	Potential scope of application/presence					
		Field use	Seed treatment	Storage	Natural presence in dust, e.g. in households	Timber protection	Veterinary
Phthalimide	Component of dust/ fungicide*	x			x		
Carbendazym	fungicide	x	x			x	
Imidacloprid	insecticide	x	x			x	x
Tebuconazole	fungicide	x	x			x	

X = most likely usage; x = usage cannot be excluded; (x) = usage not likely, but theoretically possible - *Phthalimide is officially classified as a fungicide. However, Phthalimide also could be detected because it occurs naturally in dust (see next page)

Phthalimide

According to EU regulation 2016/156, Phthalimide is converted into Folpet using a factor of 2, but no Folpet was detected in the dust samples analysed by the CBs, only Phthalimide. Phthalimide or Folpet is used as an insecticide on the field. If Folpet is absent, there is a strong suspicion that Phthalimide is not related to an application on the field. Phthalimide is found in all kinds of products, particularly in dried products.

Since Phthalimide can be found everywhere including ordinary household dust, it is almost impossible to reduce the risk of contamination in the dust in the warehouse even by thoroughly cleaning it. Contamination caused by this kind of dust does not indicate practices which are prohibited in organic production, and therefore do not constitute a reason for decertification.

Carbendazym

Carbendazym is a systemically effective fungicide. It is also a metabolite of Thiophanate methyl, which is also a fungicide used in field cultures. Thiophanate methyl is highly mobile in plants and converts to Carbendazym. This can lead to residues in the crop. It can also be used in seed treatment or as a wood preservative. For more precise statements about the nature of the possible use of Thiophanate, the samples and conditions in the warehouse should also be evaluated visually, as these might provide important information about the presence of coloured-treated seeds.

Imidacloprid

The contamination of the dust with Imidacloprid could be caused by the accidental mixing-in of treated seeds. Imidacloprid is very often used as a seed dressing. High values of Imidacloprid indicate that treated seeds or the substance Imidacloprid itself could have been stored in the warehouse in past. For more precise statements about the nature of the possible use of Imidacloprid, the samples and conditions in the warehouse should also be visually evaluated, as this might give valuable clues/information about the presence of colour-treated seeds.

Tebuconazole

Tebuconazole is a fungicide used world-wide and is often found as a residue in cereal samples. An accumulation of Tebuconazole in dust indicates that contaminated grain or even the substance Tebuconazole itself had been stored in storage facility in the past. A relatively high amount of Tebuconazole detected could indicate that the warehouse had not been cleaned well enough before storing organic cereals.

General comments on the practice and results of dust sampling in Ukraine

The results clearly show that not enough knowledge is available for a reliable assessment of residues in dust samples. This is especially the case when no records about the history of use in the warehouse is available. Yet, it is obvious that residues can be found in dust samples even if the product was handled in accordance with organic rules, due diligence was applied and no irregularities occurred. Cocktails of pesticides and other residues can always be found in dust (even outside of warehouses). Detailed studies about the complex correlation between residues detected in dust of warehouses and residues detected in the product stored there do not exist. It

is therefore very difficult, if not impossible, to make any informed predictions as to what amounts of residues detected in dust cause or are correlated with increased risks of contamination of the product stored there.

The storage of products that have been treated with pesticides, whether seeds or conventional harvested crops, leaves finest particles in the dust. Usual dry and mechanical cleaning methods can help to reduce the dust level but does not remove dust completely. If it is known that highly contaminated crops or the chemicals had been stored previously in the warehouse, the warehouse would need to be decontaminated. The decontamination would be ideally done as a combination of dust removal by suction and a subsequent wet cleaning. An even more effective measure is to renew the floor of a warehouse. Both options are very costly.

Since warehouses seem to have been the most likely place of contamination in the majority of the OFIS cases studied, CB controls should focus especially on storage conditions. During risk assessment, the history of a warehouse needs to be taken into consideration. Further, dust samples should be taken when the storage facility is inspected for the first time. This will provide an important baseline value of any substances detected before product enters the storage facility, should any contamination be detected in the product afterwards.

In order to mitigate the risk of contamination, the relationship / correlation between the history of a warehouse, the cleaning and risk-reduction measures taken and the corresponding dust analyses results needs to be further investigated. It is further suggested to gather more information about the relationship between the types of product stored, the residue levels detected in the product as well as the residue levels detected in the dust of the surrounding storage facility. The results of such research would help in developing guidelines for CBs for assessing the risk of contamination posed in a given situation.

5. Preventive measures to mitigate risks during storage and transport

It was remarked in previous chapters, that apart from intentional cases of fraud or drift on the fields, most risks for contaminations are assumed to occur during storage or transport.

Product stored in older, flat storages are particularly at risk for any contamination with unauthorised substances. Under such conditions, a thorough cleaning before the new harvest is stored, is a “must have” in quality management. In the case of severely contaminated storages, it is doubtful whether cleaning alone is sufficient. In such cases, it might be necessary to construct a new floor which is easy to clean before each loading or to use plastic films to cover the ground floor.

Most transport systems which are used for moving organic goods from the producer to the customer storage facility need to be checked and treated with special care. As with storage containers, they are a potential source of contamination as they come in contact with the product and may have been used for different purposes previously.

Therefore, this chapter highlights some preventive measures which CBs and quality management experts in Ukraine recommend organic operators implement in order to mitigate risks of contamination in storage facilities and during transport between storage facilities. These recommendations are based on guidelines developed by Gulyeva /Richter (2018) and detailed in a separate publication.

Basic recommendations for organic operators to mitigate risk of contamination during storage and transport:

- develop and implement a formal management of organic critical points, which includes a whole-farm approach;
- designate machines and transport vessels for exclusively for the use with organic products; and
- train and motivated staff to carefully implement the measures of the risk management system.

Even if an operator knows the own procedures quite well, he should still record all steps taken in order to be prepared for possible controls in the case that an irregularity is detected. When contamination is detected, all steps that were carried out have to be traced back in order to identify the likely source of contamination. All procedures and conformity records must be present in a case of an investigation of the CB. Currently, such records are oftentimes insufficient at farm or trader level.

In order to avoid unintentional nonconformities, the operator should remain in close communication with its CB, particularly in cases of uncertainty or when carrying out cleaning procedures in the warehouse.

As the product moves along the value chain, the ownership of a lot might frequently change. This process of ownership transfer and the physical product handling needs to be clear and transparent. It is of utmost importance that the responsibility and duties of both parties (buyer and seller) in the supply chain are clear.

It is further recommended that external logistic activities between harvest and sales are to be kept to a minimum and that the goods be bagged and the bag sealed at the place of production.

The following list indicates further preventive measures that can be taken to reduce the risk of contamination.

Preventive measures during intermediate storage:

- plan the crop volumes and appropriate places for the storage far in advance of harvesting.
- implement procedures to control the storage conditions of organic products and carry out risk assessments in order to evaluate contamination risks.
- ensure a thorough cleaning of storage facilities, possibly by delegating this work to professionally skilled staff.
- conduct proper record-keeping of the products stored.
- train staff involved in the proper handling of the product during intermediate storage, while recording and monitoring their level of knowledge and implementation of proper handling procedures.

Preventive measures in handling of storage equipment:

- designate equipment to be used exclusively for the storage of organic goods
- develop and apply procedures for choosing appropriate equipment.
- develop and introduce proper cleaning measures for the equipment especially when it is used both for organic and non-organic goods.
- train staff involved in the proper post-harvest treatment of organic goods, while recording and monitoring their level of knowledge and implementation of proper handling procedures.

Preventive measures for the transport of organic crops:

- prioritize the use of the company's own transport, preferably using it only for the transport of organic products.
- source additional safe transport options to be used in case of emergencies when the main transport options cannot be used.
- select leased transport options with the lowest risk for cross-contamination of the organic product.
- define a set of criteria for selecting and authorizing any kind of logistic option to be used for the transport of organic food. This needs to be done for company own transport schemes as well as for rented/leased schemes.
- define a procedure for monitoring and controlling the conditions and the travel route of organic products transportation (for example, by using GPS trackers).

- train all staff involved in transport operations and closely supervise the activities of these persons.
- ensure thorough cleaning of the truck/vessel/container, possibly by delegating this work to professionally skilled staff.
- set up an internal notification and registration procedure to document all situations in which problems occur in the compliance of the policies established by the company.
- define a procedure for analysing these problems and implementing measures, learn from the experiences and prevent the same problems in the future.

Preventive measures for terminals of vessel shipment:

- designate storage containers in the terminals to be used exclusively for organic goods.
- seal the warehouses and load the vehicles / transport facilities under the supervision of an expert of the survey company.
- document all product movement using a designated monitoring system.
- train all staff involved at the terminal in transport operations and closely supervise the activities of these persons.
- minimize the use of intermediate equipment.

The crucial factor of the organic risk management system is the personnel management and the introduction of an efficient training system for the staff so they are aware about the risks and the prevention measures in product handling.

Following these recommendations will not guarantee a full avoidance of risks, but it does support the process of identifying, controlling and mitigating individual risks.

6. Conclusions

This study set out (1) to improve the understanding situation concerning residues found in organic food products exported from Ukraine, and (2) to formulate guidelines for identifying and reducing risks for contamination through non-permitted substances based on the results of an in-depth analysis of those residue cases notified in the European Commission's Organic Farming Information System (OFIS) in 2016.

Not surprisingly, the combination of various factors such as (i) the additional sampling required by the new EU import guidelines, (ii) the growing number of exported organic lots from Ukraine, and (iii) the improved analysis technology, led to an increased total number of cases of irregularities notified in OFIS in comparison to previous years. Nevertheless, the number of irregularities in Ukraine in 2016, notified in OFIS, is moderate (affecting estimated < 1% of all exported consignments from Ukraine). Of the lots affected, two thirds were ultimately released as "organic" after additional investigations had been carried out by the respective export CB.

Yet, if analysis results of samples taken by the CB's prior the export, i.e. from crops during the growing season and from lots before they are released for export are included in the risk assessment, Ukraine and its neighbouring countries do need to be considered as relatively high risk countries in terms of contamination and irregularities. It is further interesting to note that the likeliness of residue findings vary a lot among different CBs. The reasons why some CB's have a high share of residue findings whereas for others proportionally much less residues are found are unclear and should be the subject of further assessments. One assumption is that some CBs took risk-oriented samples whereas others did not.

Sampling during the production process (field/leafs and dust) effectively supports organic integrity. Most CB nevertheless focus on residue free final products. The way a CB responds on detected irregularities, i.e. investigates a case and derives "lessons learnt" is very important.

A majority of OFIS cases from Ukrainian exports seems to be linked to insufficient management of handling procedure during the storage processes and the transport. However, drift on the field or the intentional use of unauthorised substances are also potential sources of irregularities related to exports from Ukraine.

Apart from those cases for which likely root causes have been identified, no clear explanation for discrepancies between lab results between export and import countries could be found for nearly one third of the Ukrainian OFIS cases. Further investigations should be carried out to help identify the reasons for the relatively large differences between the lab results of samples taken from the same trade lots. It is important to better understand these discrepancies in sample measurements because these may lead to significant negative economic impacts for everyone involved in the value chain, even though no rules may have been broken.

Another recommendation resulting from this study is to focus more on detecting potential contaminations on the field during the period of crop cultivation. Special attention should be given here to the testing of leaf sample of crops in which contamination has been detected in the past: rapeseeds, sunflower seeds or high quality milling wheat. CB's should have guidelines on how and when leaf samples should be best taken.

Ukrainian organic operators often complain that all Ukrainian operators are put in the same basket and treated as high-risk suppliers. In response to the stricter regulations imposed on them, operators and experts participating in the International Conference "Improving Integrity of Organic Supply Chains" in Odesa 2017 called for an amendment of the inspection policy. Instead of labelling entire countries as high-risk, focus should rather be placed on risky value chains. Supply chains considered high-risk should be relieved from extra measures, once they have demonstrated consistent compliance.

7. References

European Commission (2017): Annual Report on EU irregularities (2016) to the Committee on Organic Production. Brussels.

European Commission (2016): Guidelines on additional official controls on products originating from Ukraine, Kazakhstan and Russian Federation

https://ec.europa.eu/agriculture/organic/sites/orgfarming/files/guidelines_addoffctrl_ukraine_russian_federation_and_kazakhstan_final.pdf.

Guliyeva, O.; T. Richter (2018): Guidelines to the risk management during post harvesting, storing and transportation of organic commodities. Kyiv, Frick.

Rossier, R. and R. Bickel (2015): Pestizidrückstände in Silowänden. Frick.

Trofimtseva, O. (2017): Organic in Ukraine. Abstract of the Ministry of Agrarian Policy and Food of Ukraine, presented at Biofach 2017 in Nuremberg.

8. Annex

10.1 Overview of the analysed OFIS cases from Ukraine, which led to a decertification of lots/products after the investigation

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Decertification by the exporter CB	Assumed place of contamination/comingling	Investigations by CB	Reason of decertification after discussion with CB	Accepted explanation of exporter CB in OFIS notification paper
Spelt, shelled	Chlormequat (0,210)	1 out of 4 lots	Storage	Additional inspection	<ul style="list-style-type: none"> Unclear situation, goods were probably mixed. In a second analysis no Chlormequat, but Pirimiphos-methyl had been detected, a typical insecticide for storages. This residue could have been caused by a treatment of an empty storage. 	<p>Additional unannounced inspection (verifying operators explanation, traceability) and sampling was performed and showed the following:</p> <ul style="list-style-type: none"> Contamination was considered to be possible because conventional products were stored in the same storage (probably due to insufficient preventive measures after fumigation of empty storage).
Rape seed	Mepiquat (0,070)	Entire lot	Field	Additional inspection	<ul style="list-style-type: none"> Unclear situation, probably application on the field. It remains unclear, if the contamination was possible by drift or application. High risk farm, but operator cancelled contract with the exporter CB, therefore no more investigations could be carried out. 	<p>Additional inspection took place with traceability check, sampling and analyzing new plant from the same field.</p> <ul style="list-style-type: none"> Exporter CB accepted operator's explanations concerning contamination of rape from neighbour fields. SKAL expressed their doubts on possibility of drift. Therefore, the entire lot was decertified.

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Decertification by the exporter CB	Assumed place of contamination/ comingling	Investiga-tions by CB	Reason of decertification after discussion with CB	Accepted explanation of exporter CB in OFIS notification paper
Mustard black, seeds	Imidacloprid (0,390) Bifenthrin (0,027)	Entire lot	Transport/truck	Additional document check	Likely reason identified: fraud or contamination. Damaged big bags were repacked. The analysis of dust samples of the warehouse showed residues of many substances, because it is an old warehouse, which is not easy to clean properly.	Additional information from the operator about storage were checked. Samples taken before export and by another importer tested negative. <ul style="list-style-type: none"> According to information received from the operator as well as from the carrier, big bags were damaged during transportation, and the driver did repacking of mustard seeds in the storage where traditional product could be responsible for the contamination or mixing
Sunflower seeds	Diazinon (0,033)	4 lots	Transport/truck	Additional document check	Likely reason identified: a truck was not cleaned, only 1 of 24 truck loads showed residues. The lot of the concerned truck was decertified.	<ul style="list-style-type: none"> Additional information and communication with the CB of the importer about storage conditions and transportsations were checked. Taking into account the fact that there were 4 consignments in which residues were found, and all other consignments were clean, the exporter CB made the decision to block sunflower seeds from the contaminated consignements. Operator claims that he never used the detected pesticides. CB put Operator in a higher risk level with additional analysis

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Decertification by the exporter CB	Assumed place of contamination/ comingling	Investiga-tions by CB	Reason of decertification after discussion with CB	Accepted explanation of exporter CB in OFIS notification paper
Mustard brown, seeds	Cypermethrin (0,051)	Entire lot	Storage	Additional inspection	<ul style="list-style-type: none"> Likely reason identified: treatment of empty storage. The residue found is used for timber protection. The analysis of dust samples of the warehouse showed residues of many substances. Operator informed that product was stored outside during fumigation, but he has only one storage place! 	<ul style="list-style-type: none"> Two unannounced inspections including sampling of product and dust were conducted to the producer with purpose of verifying product flow and analysis. Operator stated that contamination might have been caused by the fumigation in the empty storages. It was decided to analyze control sample in an EU laboratory.
Wheat	Cyproconazole (0,015) Propiconazole (0,019)	Entire lot	Storage	Additional inspection	<p>Clear situation, the product was decertified because of fraud. Explanation was accepted, operator was always very cooperative and provided full information on time.</p>	<p>Unannounced additional inspection had taken place shortly before the findings of the contamination were known, no not allowed inputs were found.</p> <ul style="list-style-type: none"> The truck affected was one of the last ones to be loaded with organic wheat. By mistake, wheat from another warehouse was taken, which is not suitable for storing organic goods and where conventional wheat was stored. The mistake happened because the chief warehouse manager was not available during loading.

10.2 Overview of the analysed OFIS cases from Ukraine, which led to a release of lots/products as “organic certified”

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Assumed place of contamination/comingling	Investigations by CB	Assumed reason of contamination by CB after discussion with FiBL	Accepted explanation of exporter CB in OFIS notification paper
Chamomille	Multiple residues (4) Chlorpyrifos(-ethyl) (0,028), Prometryn (0,018), Tebuconazole (0,40), Carbendazym (0,010)	None	Additional inspection	<ul style="list-style-type: none"> Unclear situation, after the laboratories in export and import country indicated different results. Another reason could be that the lot was mixed by the importer. 	<ul style="list-style-type: none"> Additional unannounced inspection on 29.03.2016 was performed and samples for analysis were taken. According to the inspection results, traceability was checked and approved, and information from the operator was verified. Results of a second analysis in the Eurofins lab as well as results of analysis from the Ukrainian laboratory before export were negative, no residues detected.
Rape seed	Malathion (0,019) Chlorpyrifos(-methyl) (0,016)	None	Additional document check	<ul style="list-style-type: none"> Unclear situation, the substance found is near the detection limit. The lot could have been contaminated in different locations, but not in Ukraine. Sampling was done by importer of the product, samples taken before export from Ukraine were negative. 	<ul style="list-style-type: none"> Additional document checks of analysis results and traceability check were conducted. Notification was accepted before all results of investigations were received: Contamination was considered to be possible during transport or storing of organic products (before or after export). Sampling before export was performed on 30.10.2015, and analysis result received on 15.11.2015. Export of rape was done during 01.-19.02.2016. Pesticides found could be used in fumigants, and two months is a long period for storing the product. It could have been contaminated at that time, as well as during exporting. There is no information about conditions of sampling by the importer.

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Assumed place of contamination/comingling	Investigations by CB	Assumed reason of contamination by CB after discussion with FiBL	Accepted explanation of exporter CB in OFIS notification paper
Millet, hulled	Primiphos-methyl (0,005)	Storage	Additional document check	<ul style="list-style-type: none"> Likely reason identified: treatment of empty storage and improper cleaning afterwards. Since the residue level detected was very low and close to the detection limit, measuring inaccuracy in the lab cannot be excluded. 	<ul style="list-style-type: none"> Additional information about fumigation of storage and conditions of transport were checked and verified. Contamination was considered to be possible because of fumigation of the empty storages with Actelic. It cannot be excluded, that the waiting period was not as long as necessary or storages were not cleaned well enough. Residues of Pirimifos Methyl after import were low (0,005), so it was decided that this could have been due to measurement inaccuracy in the laboratory.
Spelt	Pirimiphos-methyl (0,029)	Storage	Additional document check	Likely reason identified: treatment of empty storage and improper cleaning afterwards	Information about fumigation and cleaning was checked again. CB was informed about the fumigation of empty storage facilities and appropriate cleaning measures. No residues were detected during analysis of the concerned lot (3CG) before export.
Corn	Bifentrin (0,013)	Transport/truck	Additional document check	<ul style="list-style-type: none"> The vessel was not cleaned. Prior to the corn, wood was loaded on the truck and Bifentrin is often used for timber protection. 	<ul style="list-style-type: none"> Additional information from importers, traceability documentation and expert opinions showed that there was no evidence organic regulation having been broken by the operator. Analytical results from other importers of the same lot all showed negative results.
Spelt, shelled	Pirimiphos-methyl (0,012) Chlormequat (0,001)	storage	Additional document check	Likely reason identified: treatment of empty storage with Pirimiphos-methyl and insufficient cleaning afterwards. The Chlormequat found is near the detection limit. One possible explanation for this is that the sample was taken from the last truck, meaning that the last part of the lot could be contaminated with dust from the warehouse.	<p>Previous cases of detection of Pirimiphos-methyl were compared with the new findings, additional sampling done by the operator.</p> <ul style="list-style-type: none"> Samples before export showed a level of 0.01 mg/kg Pirimiphos-methyl. Operator cleaned spelt one more time and preventive measures were implemented on place. Empty storage was treated with Pirimiphos-methyl and probably the waiting period before filling with product again was too short.

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Assumed place of contamination/comingling	Investigations by CB	Assumed reason of contamination by CB after discussion with FiBL	Accepted explanation of exporter CB in OFIS notification paper
Corn	Chlorpyrifos-ethyl (0,012)	None	Additional document check	Unclear situation: the amount detected is very low and near the detection limit, samples in storage and before loading tested negative. The importer and a non-Ukrainian exporter was responsible for transport. If contamination took place and there was no measurement error in the laboratory, contamination could have occurred both during transport and storage.	Information from operator, traceability documentation and analysis were checked and verified. There was no Chlorpyrifos-ethyl used on the farm. The importer's CB was asked to check transportation and storage conditions after export. There is a gap of two month between export and import that was unaccounted for. The importer was responsible for the storage during this time. Samples taken before export were negative.
Millet, hulled	Pirimiphos-methyl (0,017)	Storage	Additional document check	Likely reason: Treatment of empty storage, insufficient cleaning afterwards or waiting periods after cleaning not long enough.	Additional information about fumigation of storages and about conditions of transportation were requested and received. The verification of this information showed that after the fumigation of empty storage facilities, they were cleaned and ventilated and there was a waiting period before storing organic goods.
Sunflower seeds	Imidacloprid (0,015)	Transport/truck	Additional document check	Likely reason: Treatment of empty storage and not sufficient cleaning subsequently. Sample was taken from the last truck. Dust samples showed a lot of substances.	Additional information about storage conditions and transportation was requested from the operator and CB of the importer as well as verification of information received. An additional control of the other trucks used was carried out by the importer and showed the absence of the residues. Taking into account that fact that residue were detected only in one truck of the nine used, it could have been that the cleaning of storage was not sufficient or that one of the trucks was contaminated.

Product	Irregularity - in case of detected pesticide residue (mg/kg)	Assumed place of contamination/comingling	Investigations by CB	Assumed reason of contamination by CB after discussion with FiBL	Accepted explanation of exporter CB in OFIS notification paper
Corn	Glyphosate (0,070)	None	Additional inspection	Unclear situation, the amount found is near the detection limit. Contamination could have been occurred due to damaged bags: Waggon was overloaded with three bags which were broken. Planned inspection was conducted, samples from the same field were taken and no residues were found. Operator carried out a very thorough analysis and many samples were taken. Results from the same lot before export showed negative results.	Additional unannounced inspection with sampling is planned. Notification is accepted before all investigations were carried out. Before sampling by the importer, product was stored in the import country for about two weeks and it is not known how importer handled and stored the product during that time.
Millet	Glyphosate (0,030)	None	Additional inspection	Unclear situation, the amount found is near the detection limit. Contamination could also have occurred in warehouse	Additional inspection of producer of exported product were conducted by sampling and the product flow of the exporter was verified. Results showed no traces of glyphosate and there was no evidence that this prohibited substance was used. Such low concentration may have been due to contamination, and not to direct application by the farmer or processor.