German-Turkish Cooperation Organic Agriculture



Survey 2016 of the Residue Situation in Turkish Organic Products

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1 Introduction

Since December 2011, ETO and FiBL are jointly implementing the German-Turkish Bilateral Cooperation - Organic Agriculture. The overall aim of this project is to effectively and efficiently ensure the quality of Turkish organic food produced for the European market.

Information from a representative sample of selected private operators of the organic supply chains together with official data from competent authorities about unwanted residues detected in organic products from Turkey have been determined as a major indicator for the extent of reaching the project aim.

For this reason, a survey was conducted in late 2013 among German and Turkish trading companies, control bodies and the Federal Office for Agriculture and Food (BLE). The study concluded that 50 % of respondents believed that the residue situation had improved significantly since 2011. Moreover, the EU's Rapid Alert System for 2013 showed no abnormalities for Turkish organic products. Interviews during the GFA project progress audit in Turkey in June 2015 confirmed the significant reduction of residue findings and of other suspected cases in Turkish imported organic products. To hedge these findings, a further opinion poll among Central European and Turkish trading companies and institutions was carried out in the present exit phase of the project (early 2016).

The same questions were used in both surveys. However, minor changes were made in 2016, to adjust to the different project phase. The objective of the second survey was to collect up-to-date data which can be used for the performance review of the project and for developments beyond the scope of the project. The second survey covered the years 2014 – 15 (after the improvement measures of the project were implemented). As a reference, the year 2011 (before the project activities were started) was also included in the second survey.

2 General Remarks

At the moment, there is very little guidance from the EU Commission on how to handle residues in organic products. This has caused uncertainty about whether such residues can be tolerated at all, and if so, up to which level. In an attempt to arrive at a uniform interpretation, the European Organic Certifiers Council (EOCC) has put together a guideline for Certification Bodies (CBs) to manage pesticide residue cases in a consistent manner through which operators, who have made an mistake or who have not complied with the regulations will be treated fairly and assessed accordingly. The EOCC Pesticide Residues Guideline includes procedures to interpret residue analyses, technical decision making processes, checklists for easy reference, guidance for CBs on the certification decision and next steps, best practices, and templates, with an ultimate goal of improving consumer confidence in certified organic produce. The guideline is being developed continuously and might become the basis for a common residue policy in Europe. With the help of funds of the German-Turkish Cooperation, the EOCC Residue Guideline was translated into Turkish and can now easily be applied by Turkish CBs.

3 Realization of the Survey

3.1 Questionnaire

As a first step, a basic questionnaire was prepared. Then, minor modifications were made to accommodate the different situation of actors in Turkey vs. actors in importing countries.

The questionnaire was sent to the interview partners in advance, to allow them some time for preparation. In most cases the surveys were sent back electronically. Some actors opted to be interviewed on the phone.

3.2 Participating Actors

In Central Europe, the focus lied on CBs and on trading companies which trade Turkish organic products. Interviewed actors were from Germany, the Netherlands, the United Kingdom, Austria and Switzerland. A total of 16 actors from Central Europe were interviewed. In addition, some competent authorities provided complementary information.

In Turkey, the focus also lied on trading companies which export Turkish organic products into Central Europe and on CBs. A total of 6 actors were interviewed.

Actors are not explicitly mentioned here, to guard the confidentiality of their individual responses. We take the opportunity to thank all actors collectively for their valuable contribution to this survey!

3.3 Presentation and Interpretation of Results

The results for Central Europe are given in chapters 4 and 5, while the results for the Turkish actors are given in chapters 6 and 7. Chapter 8 summarizes complementary data on residue cases received from different organizations and authorities. In chapter 9, the results are summarized for all actors and in chapters 10 and 11, conclusions are drawn with respect to the project.

The results of the survey are presented in tables, where all possible answers are listed, and the frequency of responses is recorded for each possible answer (one actor giving this answer = 1). For each question, the **most frequent answer is printed in bold**. Comments were mentioned once, unless otherwise indicated. Where possible, the result from the 2013 survey is indicated at the bottom of the table for comparison (*).

Note: the total number of answers to each question may deviate from the number of participants in the survey. This is because (1) multiple answers were possible, (2) not all participants answered all questions, and (3) answers were collated from several years.

As the survey was designed to investigate the perception of the residue issue, it gives only limited information on the true occurrence of pesticide residues. For example, one residue case could be mentioned by several actors in the trade chain (supplier, client, CB). Quantitative comparisons of individual answers should therefore be made with caution. It should be kept in mind that Turkish exporters and Central European importers have different perspectives even if they trade the same

goods. Exporters are mainly concerned with aspects related to production and certification, while importers take certification for granted, and are mainly concerned with consumers' acceptance.

4 Results of the Survey among Central European Actors

4.1 Residue Testing

Question 4.1.1:
How many residue tests did your company execute on Turkish organic products in 2015?

Possible answers	**Frequency of responses[1]**
0 to 20 tests	**7**
20 to 50 tests*	2
50 to 100 tests	2
More than 100 tests	5
*Most frequent answer in 2013 survey	

Question 4.1.2:
Frequency of analysis: I analyse Turkish organic products…

Possible answers	**Frequency of responses**
with the same frequency as organic products from other origins*	**8**
less frequently than organic products from other origins	-
more often than organic products from other origins	7
always	1
*Most frequent answer in 2013 survey	

Comments from importers[2]
The amount of analyses by our supplier has strongly increased.
We have done more testing due to negative experiences.
We have experienced low level of contamination in a number of products (apricots, raisins, lentils). We have also experienced decertification of some consignments (sultanas, lentils).
All organic raw material undergoes an explicit pesticide screening.
We see no higher risk than with products from Poland, Bulgaria, Serbia etc.
We test more often as a country/product is classified according to risk analysis. This is the case for products from many countries.
Turkey is considered a high-risk country relating to pesticides.

[1] As stated in chapter 3.2, a total of 16 Central European actors were interviewed for the questions in chapters 4 & 5.

[2] Unless explicitly stated, each comment was given 1x.

Question 4.1.3: **Compared to 5 years ago (2011), do you currently execute more or less residue tests?**	
Possible answers	**Frequency of responses**
The number of residue tests has substantially decreased (more than 50% less).	-
The number of residue tests has slightly decreased (10 to 50% less).*	3
No change in number of residue tests.*	4
The number of residue tests has slightly increased (10 to 50% more).	**5**
The number of residue tests has substantially increased (more than 50%).	4
*Most frequent answers in 2013 survey (question 4.2.2 then)	
Comments from importers	
Decreased testing as our supplier is doing more testing and provides us with the results. Since they are using the same laboratories we use, we accept the results as equivalent.	
Decreased testing as trade with Turkey has decreased in 2015 compared to 2014.	
Increased testing due to market requirements and greater risk due to environmental contamination	
Increased testing as we are working with suppliers to reduce the risk of contamination, so testing is required to assess progress.	
Increased testing as our company has grown and we need more raw material.	
Increased testing due to higher demand of organic products.	
Comments from CBs	
Several CBs mentioned that testing has increased due to legislative requirements. The EU-regulation now requires more testing (5% of operators).	
More testing due to application of risk-based inspection.	

Question 4.1.4: **Information on residue analysis performed by your CBs/you (if you are a CB)**	
Possible answers	**Frequency of responses**
Our CBs is/ *We are* regularly taking samples on processing level and analysing them.	**9**
No residue analysis is done by our CBs/*by us* on processor level.	3
Our CBs are informing me/*we are informing our clients* about the analysis results.	6
I do not get any information from our CB/*we do not give information* regarding the analysis results.	2
Our CB informs me/ *We inform clients* about the analysis results only in case of residue detection.	1

Question 4.1.5: **Information on residue analysis performed by you (relevant for companies only)**	
Possible answers	**Frequency of responses**
We are regularly taking samples on processing level and analysing them.	**10**
No residue analysis is done by us on processor level.	3
We are informing our clients about the analysis results.	**10**
We inform clients about the analysis results only in case of residue detection.	-
Comments from importers	
We provide details of analysis to our clients when requested, on the lots that they purchase only.	

Question 4.1.6: **Are you aware that third parties analyze Turkish organic products which you trade?**	
Possible answers	**Frequency of responses**
Yes	**10**
No	4
If yes, by whom?	
Competent Authorities	5
Consumers/Importers in country of destination	2
Turkish CBs (one actor stated mostly in problematic cases)	1
Turkish exporters*	1
Accredited labs	1
CBs in countries of destination	1
*Most frequent answer in 2013 survey	
Comments	
One actor mentioned that third party testing depended on the client.	

4.2 Pesticide Residues

Question 4.2.1: **Have you encountered cases[1] of pesticide residues in your organic food products?**	
Year 2011, possible answers	**Frequency of responses**
Yes*	**10**
No	3
Year 2014, possible answers	**Frequency of responses**
Yes*	**11**
No	4
Year 2015, possible answers	**Frequency of responses**
Yes*	**12**
No	3
*'yes' was also the most frequent answer in the 2013 survey, but it related to different years then.	
Comments from importers (for all years)	
Dried apricots used to be most critical, but now sultanas are most critical.	

[1] In this context, a "case" is defined by having evidence of pesticide residues in organic products, regardless of the amount, or reason or whether it affected the certification status of the product.

Question 4.2.2: **Which crops were tested positive with residues?**	
Possible answers	**Frequency of responses**
Apricots (dried/fresh)	14
Sultanas[3]	**19**
Hazelnuts	-
Lentils* (5 x 2011, 3 x 2014, 2x 2015)	10
Other fruit and berries: lemons (1x), oranges (2x), avocadoes (1x), apples(1x), peaches (3x), sour cherries (3x), sweet cherries (2x), strawberries (4x), dried figs (1x), frozen strawberries (1x), blueberries (1x)	20
Vegetables: tomatoes (2x), cucumbers (1x), beans (1x), mushrooms (1x), Peppers (3x), frozen peppers (1x), broccoli (1x), cauliflower (1x)	11
Herbs and spices: ginger (1x)	1
*Most frequent answer in 2013 survey	
Comments by the authors	
Apricots, sultanas, hazelnuts and lentils are shown separately, to allow direct comparison with the 2013 survey. Apricots, sultanas and hazelnuts are focus commodities of this project. In lentils, there was an important residue case in 2010. The figures in this table are influenced by the findings in 2011.	

Question 4.2.3: **Which pesticides were detected? Please give name of pesticide and quantity detected.**	
Possible answers	**Frequency of responses**
Carbendazim (fungicide)	**13**
Chlorpyrifos (insecticide)	8
Cypermethrin (insecticide)	7
Pyrimethanil (fungicide)	4
Dodine (fungicide)*	4
Phosphinic acid (fungicide)	3
Metalaxyl (fungicide)	3
Chlorate (herbicide)	3
Chlorothalonil (fungicide)	2
Piperonylbutoxid (abbreviated: PBO; synergist for insecticides; tolerated in organic agriculture)	2

[3] The category sultanas also includes raisins

Glyphosate (herbicide)*	2
Spinosad (insecticide permitted in organic agriculture)	2
Chlormequat (plant growth regulator)	2
Iprodione (fungicide)	2
*Most frequent answer in 2013 survey	
The following pesticides were mentioned once: antrachinon, azoxystrobin, bifenthrine, biphenyl, cyhalothrin, cyprodinil, dithiocarbamates, fenbutatinoxid, fenhexamid, fenpyroximat, fosetyl, imidacloprid, propiconazol, procymidon, sorbic acid, tebuconazol, thiacloprid and trifloxystrobine. It was not possible in most cases to assign individual pesticides to crops.	
Comments from importers	
One company stated that the German benchmark values for 'amaltoxin' are too strict.	
Attention should also be brought to laboratory programs. Detection limits lower than 0.01 mg/kg do not make sense in organic products.	
Comments from CBs	
In 2014, approximately 12% of samples analysed exhibited residues (10% in 2015).	

Question 4.2.4:
Who detected the residues?

Possible answers	**Frequency of responses**
Exporter	6
CB (Turkish or European)	4
Importer*	**22**
Authority	1
Other	11
*Most frequent answer in 2013 survey	
Comments from importers	
Other: Retailers	2
Other: Clients	6
Comments from CBs	
Other: Operator	3

Question 4.2.5: **What were the consequences of the residue cases?**	
Possible answers	**Frequency of responses**
The product was already marketed when the residues were detected.	7
The residue case has substantially delayed the marketing.	7
The residue case has produced additional costs for the company.	**16**
Finally the product in question could be marketed as organic.*	12
Residue detected in a preliminary sample; as a result, the goods were not imported.*	2
Organic status of the product withdrawn by the CB.	5
Goods voluntarily have been sold with conventional indication.	6
Goods could not be marketed at all.	2
*Most frequent answer in 2013 survey	
Comments from importers	
Sensitivity on certification level has increased in general.	
Our sampling is almost exclusively undertaken before taking ownership of the goods.	

4.3 Origins and Causes of Contamination

This section reports the suspicions of Central European companies about the origins of residues. In general, the origins are assumed to be in Turkey. However, the origins may or may not have been verified in individual cases. This section should therefore be interpreted with caution.

Question 4.3.1: **I suspect that residues are mainly caused during the following production steps:**	
Possible answers	**Frequency of responses**
while growing in the field*	**12**
during drying (on farm level)	4
during transport (from farm to factory)	-
during storage (in the factory)	4
during processing (in the factory)	8
other	4
*Most frequent answer in 2013 survey	
Comments from importers	

Other: Chlorate residue can definitely be traced to washing produce with chlorinated water.
Environmental cause: organic and conventional fields using the same irrigation water.
Other: Intentional mixing
Other: Packaging

Question 4.3.2:
I suspect that the residues have been caused by the following reasons:

Possible answers	**Frequency of responses**
use of unauthorized pesticides by organic farmers	4
drift from neighbouring fields*	10
previous contamination of the soil	3
contamination during processing in the factory	**11**
contamination caused by storage preservatives	5
contamination from packaging material	1
unintentional commingling with conventional goods	4
intentional mixing with conventional goods	4
confusion with conventional goods (insufficient labelling)	2
Other:	1

*Most frequent answer in 2013 survey

Comments from importers
Other: Shared use of spray equipment in villages by both organic and non-organic growers.
Commingling could be intentional but is probably not a big factor.
Drift from neighbouring fields in a more broad sense such as through irrigation water.
Comments from CBs
Dodine was found in apricots one year, whereas not in the following year. This cannot be explained due to different field or processing conditions. This is an indication for commingling.

Question 4.3.3:
I suspect that the residues are due to the following shortcomings:

Possible answers	**Frequency of responses**
fields are not suitable for organic farming	5
equipment, machinery or installations are not suitable for organic farming / processing	1
lack of knowledge*/**	**10**
farmers / traders / staff are not enough motivated for quality issues*	5
insufficient separation and/or identification of goods	3
inadequate cleanliness / hygiene	3
fraud	4
other	1

*Most frequent answer in 2013 survey

** “Lack of knowledge” was not only mentioned most frequently, but also strongly highlighted by many actors.

Comments from importers
Due to changes in climate there is rainfall even after April/May – farmers cannot cope with this. To avoid losses, the goods are sprayed but offered as organic nevertheless. It is becoming increasingly difficult to find completely residue-free goods. Residue analysis is increasing, as well as prices.
Fraud is the least prevalent of these issues, but all are a problem in some cases (mentioned twice).
What is needed most is the willingness to solve issues.
Lack of knowledge on what organic actually means.

4.4 Personal Opinions on the Overall Situation

Question 4.4.1:
What is your personal opinion regarding pesticide residues in organic products from Turkey?

Possible answers	**Frequency of responses**
There are no such problems	1
There are problems, but no worse than in other countries*	**8**
The problem is more pronounced than in other countries	3
Situation is critical and improvements are necessary	4

*Most frequent answer in 2013 survey

Comments from importers
Although the problem is comparable to other countries, it is critical and has to be improved.
The situation is worse than in other countries and improvements are necessary. However, “serious” may better describe the situation than “critical”.
If you are too critical as an importer you will not have goods as it is a sellers’ market.
Comments from CBs
There are several comparable countries.

Question 4.4.2:
Have you noticed a trend since 2011?

Possible answers	**Frequency of responses**
No trend	**8**
Situation has improved*	4
Today, the situation is worse than in 2011	1

*Most frequent answer in 2013 survey

Comments from importers
Although the situation has improved, it is critical and needs to be improved.
Turkish Government and CBs have become more sensitized which should improve the situation.
The organic legislation in Turkey is a good start.
Comments from CBs
It seems that less residue cases appear.
More testing has revealed more pesticide detections. Not sure if there is a trend.

Question 4.4.3:
In residue cases, what was your personal experience with your own authorities?

Possible answers	**Frequency of responses**
No experience*	**7**
They acted appropriately	**7**
Their reaction was inappropriate	1

*Most frequent answer in 2013 survey

Comments from importers on why reaction was inappropriate
No professional exchange. Authorities hide behind laws and there is no pragmatic approach in finding solutions.
Authorities are sometimes too harsh and sometimes too soft, depending on the perspective. The importer is in the weak position.

Question 4.4.4:
In residue cases, what was your personal experience with Turkish authorities?

Possible answers	**Frequency of responses**
No experience*	**9**
They acted appropriately	-
Their reaction was inappropriate	5

*Most frequent answer in 2013 survey

Comments from importers on why reaction was inappropriate
They often do not understand why there would be residues and accuse companies of making mistakes in the analysis.
Very black or white approach.
Comments from CBs on why reaction was inappropriate
CBs in Turkey do not respond in investigation.

Question 4.4.5:
In residue cases, what was your personal experience with your own CB?

Possible answers	**Frequency of responses**
No experience	5
They acted appropriately	**8**
Their reaction was inappropriate	1

Comments from importers on why reaction was inappropriate
CB only forwards documents to exporter CB but gives no own reaction.
If only one CB is involved, then the process is smooth. If several CBs are involved things get stuck and communication in regards to issues becomes difficult. Importers would like to know what is going on.

Question 4.4.6:
In residue cases, what was your personal experience with Turkish CBs?

Possible answers	**Frequency of responses**
No experience*	4
They acted appropriately	**5**
Their reaction was inappropriate	4

*Most frequent answer in 2013 survey

Comments from importers on why reaction was inappropriate
Everything takes too long, although we only have indirect experience as our suppliers speak to their CBs.
It depends on the situation. Usually there is denial that anything could be wrong.
Investigations into residue findings is often shallow and not rigorous. Often CBs will not investigate if the levels found are below the BNN orientation value. This allows the perception that any residue found below the BNN orientation value is of little or no concern.

Question 4.4.7: **In residue cases, what was your personal experience with suppliers?**	
Possible answers	**Frequency of responses**
No experience	1
They acted appropriately*	**7**
Their reaction was inappropriate	4
Mixed (for some exporters, it was appropriate; for others, it was inappropriate)	-
*Most frequent answer in 2013 survey	
Comments from importers on why reaction was inappropriate	
There is room for improvement as answers often take long and there is not enough investigation into the actual causes of contamination.	
There is too much willingness for suppliers to hide behind CBs rather than taking responsibility for products themselves.	
There is a lack of knowledge and lack of understanding of the urgency of a problem.	
It depends on the situation. Usually there is denial that anything could be wrong.	
Counter-analysis by supplier was performed with mixed samples which comprised more than concerned food lot and is therefore not comparable	

Question 4.4.8: **Further experiences. With whom?**	
Possible answers	**Frequency of responses**
They acted appropriately	-
Their reaction was inappropriate	**2**
Comments from importers with whom and why reaction was inappropriate	
Authorities in importing country acted inappropriately (pulses were classified as grains).	
Comments from CBs with whom and why reaction was inappropriate	
In Turkey real issues of fraud were ignored and instead the focus was put on issues of sampling and testing.	

5 Suggestions for Improvements by Central European Actors

We kindly asked the interview partners for suggestions regarding subjects which need to be improved and possible corrective measures. As the project is currently in the phasing-out period, these suggestions are important in planning sustainable processes for improvement beyond the scope of the project.

Question 5.1: **What are the most urgent improvements?**	
Possible answers	**Frequency of responses**
No suggestions	2
More modern / better suited equipment, machinery, installations or facilities	1
Better cleaning / maintenance	**3**
Better hygiene conditions	1
Better separation of organic and conventional products*	**3**
Better labelling of goods and lots	-
Other (see comments)	(6)
*Most frequent answer in 2013 survey	
Comments from importers	
Improvements in management of separation, use of spraying equipment, control and siting of drying beds, and management of pesticide usage by non-organic growers could all be of benefit.	
Acknowledgment of “organic production” as a whole. An assessment value analogue with the BNN should be created. A revision of the organic regulation including a clear formulation on residues and standardization of procedures when dealing with residues should take place. Clarification of discrepancy in reporting obligation of residues.	
More research on behaviour of pesticides in crops. Research should be broader and not performed case by case.	
Increased knowledge and training on organic production.	
Comments from CBs	
Mutual understanding of the situation in Turkey and Germany (EU) is important. The whole chain of commerce should be involved in the improvement process: growers, processors, exporters, and importers. Exporters and importers play a key role in improving the chain of commerce.	

Question 5.2: **How can improvements be achieved best?**	
Possible answers	**Frequency of responses**
Better training of farmers*	**11**
Better training of processors	8
Better training of inspectors	5
More information to Turkish exporters	6
More information to European importers	3
Better awareness / motivation of staff for quality issues	7
Tougher sanctions for irregularities	3
More frequent analyses by exporters	-
More frequent analysis by importers	1
Other	1
*Most frequent answer in 2013 survey	
Comments from importers	
An overarching body to guide improvements.	
Open communication.	

6 Results of the Survey among Turkish Actors

6.1 Residue Testing

Question 6.1.1: **How many residue tests has your company executed for organic products in 2015?**	
Possible answers	**Frequency of responses[4]**
0 to 20 tests*	-
20 to 50 tests	-
50 to 100 tests	1
more than 100 tests	**5**
*Most frequent answer in 2013 survey	

Question 6.1.2: **Compared to 5 years ago (2011), do you presently execute more or less residue tests?**	
Possible answers	**Frequency of responses**
The number of residue tests has substantially decreased (more than 50% less)	-
The number of residue tests has slightly decreased (10 to 50% less)	1
No change in number of residue tests*	**2**
There is a slight increase of residue tests* (10 to 50% more)	1
There is a substantial increase of residue tests (more than 50%)*	1
*Most frequent answers in 2013 survey	
Comments from exporters	
More testing as the number of organic farmers has increased.	
New compounds which cannot be detected with pesticide screenings such as DDAC, BAC, phosphonic acid and fosetyl need additional tests.	
Comments from CBs	
The organic farming area has increased. Farmers have started using more modern equipment and machines and the number of consultancy companies who provide training to farmers has increased. Also, awareness of organic agriculture and the organic market share have increased. All these factors provide improved integrity of organic products.	

[4] As stated in chapter 3.2, a total of 6 Turkish actors were interviewed for the questions in chapters 6 & 7.

Number has increased as we do not release products without analysis (usually due to lack of trust towards producers, especially intermediary traders).

Question 6.1.3:
Information on residue analysis performed by your CB / by your company

Possible answers	Frequency of responses
My CB is / we are regularly taking samples on processing level and analysing them.*	**3**
No residue analysis is done by my CB / by us on processor level.	-
My CB is informing me / we are informing our clients about the analysis results.	2
I do not get any information from my CB regarding the analysis results.	-
My CB informs me / We inform clients about the analysis results only in case of residue detection.	2

*Most frequent answer in 2013 survey

Question 6.1.4:
Information on residue analysis performed by companies

Possible answers	Frequency of responses
We are regularly taking samples on processing level and analysing them.*	**2**
No residue analysis is done by us on processor level	-
We are informing our clients about the analysis results*	**2**
We inform clients about the analysis results only in case of residue detection	-

*Most frequent answer in 2013 survey

Question 6.1.5:
Are you aware about residue analysis of your/your clients products performed by 3rd parties?

Possible answers	Frequency of responses
Yes*	**4**
No	1

*Most frequent answer in 2013 survey

Comments from CBs

Organic Open Markets, Government Offices or other CB's.
Importers, importers' CBs, importing country authorities, importers' clients, clients' CBs, frankly all supply chain actors. It is becoming an analysis based approach, trust is decreasing, cost is increasing, and suspicion is all over the organic sector.
We are informed by our clients by 3rd party sampling reports.

6.2 Pesticide Residues

Question 6.2.1:
Have you encountered cases[1] of pesticide residues in your organic food products?

Year 2011, possible answers	**Frequency of responses**
Yes*	**4**
No	2
Year 2014, possible answers	**Frequency of responses**
Yes	**4**
No	2
Year 2015, possible answers	**Frequency of responses**
Yes	**4**
No	2

*'yes' was also the most frequent answer in the 2013 survey, but it related to different years then.

[1] In this context, a "case" is defined by having evidence of pesticide residues in organic products, regardless of the amount, or reason or whether it affected the certification status of the product.

Question 6.2.2: **Which crops were tested positive with residues?**	
Possible answers	**Frequency of responses**
apricots (dried/fresh)	8
sultanas[5]	4
hazelnuts (1x)	1
Lentils (3x) /chickpeas (3x)	6
Other fruits and berries: strawberries (7x), grapes (3x), sour cherries (3x), apples (3x), olive (2x), mulberries (2x), cherries (1x), figs (1x), fruits general (1x), dried fruits (1x)	28
Vegetables: tomatoes (5x), cucumber (3x), peppers (1x), eggplant (1x), broccoli (1x), broad beans (1x), lettuce (1x), arugula (1x), spinach (1x), onion (1x), garlic (1x), vegetables (unspecified) (1x)	18
Arable crops: soybean (4x), barley (4x), sunflowers (3x), corn (3x), wheat (1x), millet (1x), rapeseed (1x)	17
Herbs and spices: anise (1x), flax seeds (1x), poppy seeds (1x), fennel (1x), parsley (1x), herbs (unspecified) (3x)	8
Feed (1x)	1
Cotton (3x)	3
*Most frequent answer in 2013 survey	
Comments by the authors	
Apricots, sultanas, hazelnuts and lentils are shown separately, to allow direct comparison with the 2013 survey. Apricots, sultanas and hazelnuts are focus commodities of this project. In lentils, there was an important residue case in 2010.	

[5] The category sultanas also includes raisins

Question 6.2.3:
Which pesticides were detected? Please give name of pesticide and quantity detected.

Possible answers	Frequency of responses
Chlorpyrifos (insecticide)	**8**
Acetamiprid (insecticide)	7
Cypermethrin (insecticide)	5
Carbendazim (fungicide)	5
Spinosad (insecticide, allowed in organic agriculture)	5
Azoxystrobin (fungicide)	5
Tebuconazole (fungicide, plant growth regulator)	4
Pyraclostrobin (fungicide)	3
Dodine (fungicide)	3
Cyprodinil (fungicide)	2
Dithiocarbamates (group of substances)*	2
Fosetyl (fungicide)	2
Biphenyl (environmental contaminant or fungicide)	2
Permethrin (insecticide)	2
Difenoconazole (fungicide)	2
Diflubenzuron (insecticide)	2
Pyridaben (insecticide, acaricide)	2
Boscalid (fungicide)	2

*Most frequent answer in 2013 survey

Comments

The following pesticides were mentioned once: bifenthrine, buprofezin, chlormequat, chlorothalonil, cyclanilide, cyhalothrin, deltamethrin, diethyltoluamide, diuron, epoxconazole, ethoxyquin, fenhexamid, fludioxonyl, glyphosate*, iprodion, indoxacarb, malathion, metalaxyl, piperonyl butoxide, phosphonic acid, propiconazol, pyrimethanil, sorbic acid (not a pesticide, but a preservative), thiacloprid, thiophanate-methyl and trifloxystrobine.

It was not possible in most cases to assign individual pesticides to crops.

Question 6.2.4: **Who detected the residues?**	
Possible answers	**Frequency of responses**
Company	3
CB (Turkish or European)	**14**
Client*	3
Authority	6
Other	-
*Most frequent answer in 2013 survey	
Comments from CBs	
Most residues were detected during our sampling, however some residues were notified by another CB or authorities.	

Question 6.2.5: **What were the consequences of the residue cases?**	
Possible answers	**Frequency of responses**
The product was already marketed when the residues were detected.	1
The residue case has substantially delayed the marketing.*	8
The residue case has produced additional costs for the company.*	6
Finally the product in question could be marketed as organic.	7
Residue detected in a preliminary sample; as a result of this, the goods have not been accepted by the client.	1
Organic status of the product withdrawn by the CB.	7
Goods voluntarily have been sold with conventional indication.	1
Goods could not be marketed at all.	**10**
*Most frequent answer in 2013 survey	

6.3 Origins and Causes of Contamination

Question 6.3.1:
I suspect that residues are mainly caused during the following production steps:

Possible answers	Frequency of responses
While growing in the field*	**6**
During drying (on farm level)	1
During transport (from farm to factory)*	1
During storage (in the factory)	2
During processing (in the factory)	4
Other	1

*Most frequent answer in 2013 survey

Question 6.3.2:
I suspect that the residues have been caused by the following reasons:

Possible answers	Frequency of responses
use of unauthorized pesticides by organic farmers	4
drift from neighbouring fields*	**6**
previous contamination of the soil	2
contamination during processing in the factory	3
contamination caused by storage preservatives	2
contamination from packaging material	-
unintentional commingling with conventional goods	3
intentional mixing with conventional goods	2

*Most frequent answer in 2013 survey

Comments from CBs

Using the same equipment in organic and conventional farming.

Question 6.3.3: **I suspect that the residues are due to the following shortcomings:**	
Possible answers	**Frequency of responses**
fields are not suitable for organic farming (fragmented field structure increases the risk of drift)	2
equipment, machinery or installations are not suitable for organic farming / processing	2
lack of knowledge*	**5**
farmers / traders / staff are not motivated enough for quality issues	2
insufficient separation and /or identification of goods	4
inadequate cleanliness / hygiene	3
fraud	3
*Most frequent answer in 2013 survey	

6.4 Personal Opinions on the Overall Situation

Question 6.4.1: **What is your personal opinion regarding pesticide residues in organic products from Turkey?**	
Possible answers	**Frequency of responses**
There are no such problems	1
There are problems, but not worse than in other countries*	**3**
Situation is critical and improvements are necessary	**3**
*Most frequent answer in 2013 survey	

Question 6.4.2:
Have you noticed a trend since 2011?

Possible answers	**Frequency of responses**
No trend	2
Situation has improved*	**4**
Today, the situation is worse than in 2011	-

*Most frequent answer in 2013 survey

Comments from CBs
There is a Turkish competent authority law in place but it is valid only for the local market. So we can say that the situation has improved for the local organic trade but not for EU or other international organic trade. A law is not in place for international programs. This leaves a certain degree of freedom for the producers/traders and certifiers. They do not feel the authority of the scheme owners.
Residue cases have declined since 2011.

Question 6.4.3:
In residue cases, what was your personal experience with your own authorities?

Possible answers	**Frequency of responses**
No experience	-
They acted appropriately	**5**
Their reaction was inappropriate*	1

*Most frequent answer in 2013 survey

Comments from CBs why reaction was inappropriate
Instead of giving penalties to the operators, they put pressure on CBs, investigate them and give them penalties.
They react only for Turkish regulation certified products. Fines are issued to producers and CBs. The authority acted appropriately for the local program only. For EU and other international schemes no responsibility is taken, so those issues need to be dealt with the EU Commission or other authorities.

Question 6.4.4:
In residue cases, what was your personal experience with authorities in Europe?

Possible answers	**Frequency of responses**
No experience	-
They acted appropriately	**1**
Their reaction was inappropriate	-

Question 6.4.5: **In residue cases, what was your personal experience with your company's CB?**	
Possible answers	**Frequency of responses**
No experience	1
They acted appropriately*	**4**
Their reaction was inappropriate	-
*Most frequent answer in 2013 survey	

Question 6.4.6: **In residue cases, what was your personal experience with European CBs?**	
Possible answers	**Frequency of responses**
No experience	-
They acted appropriately*	-
Their reaction was inappropriate	1
*Most frequent answer in 2013 survey	
Comments from CBs	
We faced some cases where there was lack of investigation by European CBs. It was also not always clear what was being investigated by their clients.	

Question 6.4.7: **In residue cases, what was your personal experience with European companies?**	
Possible answers	**Frequency of responses**
No experience	-
They acted appropriately	-
Their reaction was inappropriate	-

Question 6.4.8: **Further experiences. With whom?**	
Possible answers	**Frequency of responses**
They acted appropriately	**3**
Their reaction was inappropriate	1
Comments from exporters with whom and why reaction was inappropriate	
Neighbouring farmers	
Comments from CBs with whom and why reaction was inappropriate	
Suppliers (were mentioned several times). One comment was that they generally take defensive positions.	

7 Suggestions for Improvements by Turkish Actors

We kindly asked the interview partners for suggestions regarding subjects which need to be improved and possible corrective measures. As the project is currently in the phasing-out period, these suggestions are important in planning sustainable processes for improvement beyond the scope of the project.

Question 7.1:
What are the most urgent improvements?

Possible answers	**Frequency of responses**
More modern / better suited equipment, machinery, installations or facilities	1
Better cleaning / maintenance*	2
Better hygiene conditions*	2
Better labelling of goods and lots*	**3**
Other	1

*Most frequent answer in 2013 survey

Comments from CBs

Local authority must take responsibility for all organic products produced and exported, not only for local regulation but also for private standards.

Question 7.2:
How can improvements be achieved best?

Possible answers	**Frequency of responses**
Better training of farmers*	**6**
Better training of processors	5
Better training of inspectors	4
More information to Turkish exporters	**6**
More information to European importers	5
Better awareness / motivation of staff for quality issues	5
Tougher sanctions for irregularities	3
More frequent analyses	2
Other	2

*Most frequent answer in 2013 survey

Comments from companies

Training program should cover logistic companies, consumers, second and third parties, companies, laboratory staff and methods.
In order to approach the whole picture and see the other 50%, it is important to check out the situation and conditions of second and third parties, such as processors, distributors, markets, laboratories and logistic companies.
Comments from CBs
Better investigation of exporters, better inspection of export items and exporters, and better audits of CBs.
List of people involved in irregularities should be prepared (with exporters and also importers). They must be watched by local authorities.
In Turkey farms are small and profit is very difficult to make. The only motivation for the farmers to be in organic is the state fund for organic production and premium paid by the traders. In general only 3-5% of organic production from Turkey is traded as organic, the rest is just sold as conventional. Therefore there is doubt for the conformity of products to organic standards. In this situation I am not very optimistic towards the future of organic production in Turkey. To improve the situation, there should be less emphasis on analysis results.
Organic farming and producing is well known in theory, however practical experience is limited. Awareness of the basic organic principles should be improved, even if there has been an increase compared to the past. Since 2011, there has been an increase in consultancy companies, financial support to producers as well as exporters and the land area of organic farming has increased. These are fundamental factors helping to reduce residues cases. There has been a clear decline regarding positive analysis results since 2011.

8 Complementary data

This survey was complemented with residue data from various other sources (publicly accessible and other).

8.1 Ökomonitoring Baden-Württemberg

Since 2002, the German state of Baden-Württemberg carries out a specific monitoring programme in the area of organic foods. They systematically analyze food from organic and conventional agriculture in respect to residues and contaminants. We checked the reports for the years 2011 – 2014 for residue cases involving products from Turkey[6].

In total, 68 samples of Turkish products were analysed. A range of residues were found in traces (<0.01 mg/kg). Eleven samples exhibited residue concentrations above 0.01 mg/kg. Products affected by residues levels above 0.01 mg/kg were dried apricots, raisins, sultanas, hazelnuts and lentils. Residues found in these products were benzalkonium chloride (BAC), carbendazim, chlorate, chloranthraniliprol, cypermethrin, diquat, glyphosate, 2.4-D, iprodione, metalaxyl/ metalaxyl M, phosphonic acid and pyrimethanil.

8.2 Bundesverband Naturkost Naturwaren (BNN)

Since 2003, BNN has been systematically analyzing organic fruits and vegetables from natural food retail for pesticide contamination. BNN kindly provided a compilation of residue cases involving products from Turkey, based on their internal database. The compilation covered the years 2011 – 2016.

In total, 12 samples of fresh Turkish products were analysed. Three of these samples exhibited pesticide residues. One sample of lemons showed residues of benzalkoniumchloride (BAC) above 0.01 mg/kg, plus traces of chlorpyrifos and of DDAC. Residue levels below 0.01mg/kg were found once in pomegranates (ortho-phenylphenol), and once in apricots (spinosyn A and D, permitted in organic farming).

Within the category of dried Turkish products, 43 samples in total were analysed. 15 of these samples showed traces of pesticides, however it should be noted that the values did not include a processing factor. Residue levels above 0.01 mg/kg were found in 13 of these 15 samples. Four cases concerned pomegranate seed oil. In two of these cases only 1 pesticide was found (chlorpyrifos), whereas the other two samples contained at least 7 pesticides (boscalid, chlorpyrifos, cypermethrin, difenoconazol, fenvalerat, imazalil, iprodion, prochloraz, propriconazol and pyrimethanil). Five cases concerned sultanas (1x only spinosad, 2x only metalaxyl, 1x only phosphonic acid and 1x iprodion, metalaxyl, and pyrimethanil). Two cases concerned dried

[6] source: http://oekomonitoring.cvuas.de/berichte.html

apricots (1x only carbendazim and 1x carbendazim and dodine), one concerned cumin (glyphosate) and one chickpeas (bromide).

8.3 German Federal Office for Agriculture and Food (BLE)

The German Federal Office for Agriculture and Food provided us with a summary of residue cases reported in Germany and provided to the European Commission's Organic Farming Information System (OFIS). The summary covers the years 2011 – 2015.

Due to the nature of this data collection, the number of analyzed samples in not known. In total, 46 cases of residues in products from Turkey were reported to OFIS. The following commodities were affected: dried apricots, sultanas, hazelnuts, lentils, chickpeas, other fruit and berries (strawberries; purée and frozen, sour cherries), herbs and spices (oregano, anise, dried capers).

The following pesticide residues / contaminants were reported: carbaryl, carbendazim, chlorate, chlorpyrifos, cypermethrin, cyprodinil, dichlorvos, deltamethrin, glyphosate, fenbutatin oxide, hexythiazox, perchlorate, phosphine, phosphonic acid, piperonyl butoxide (PBO), prochloraz, and heavy metals (which are not pesticides, but contaminants). The amounts of these pesticides which were detected were not included in the summary.

The Office emphasizes that this compilation has limited informative value regarding the true prevalence of residues in Turkish organic products, because it is based on a risk-based sampling, according to the operators' risk analysis.

8.4 European Commission – DG Agriculture and Rural Development

The European Commission provided us with a summary of pesticide residue cases recorded in the "Third country Irregularity" module of its 'Organic Farming Information System' digital communication platform. The summary covers cases notified by the Member States of the European Union in the years 2013 – 2015, plus the records for 2016 available until April 2016. Negative results are not reported to this system. There is likely a considerable overlap of these data with those provided by BLE. However, both data sets are shown here, because only the data from BLE cover the years 2011 and 12, while those provided by the European Commission cover also the first months of 2016, and include data from countries other than Germany.

In 2013 – 2015, 45 cases of pesticide residues above 0.01 mg/kg in products from Turkey were reported. In 2016, 12 cases had been reported by April. The following commodities were affected: apricots (dried / fresh), sultanas, raisins, hazelnut paste, lentils, chickpeas, other fruit and berries (dried figs, prunes, frozen strawberries and sour cherries, apple juice concentrate, lemon juice concentrate, pomegranate, grapefruit, strawberry purée), dried tomatoes, soybeans, herbs and spices (oregano, anise, sage) and cereals (bulgur, durum wheat).

The following pesticide residues / contaminants were reported: acetamiprid, AMPA, captane, carbaryl, carbendazim, clofentezine, chlorantraniliprole, chlorate, chlorethanol, chlormequat, chlorpyrifos, cypermethrin, DDAC, dodine, ethylene oxide, formetanate, hexythiazox, imazalil,

imidacloprid, malathion, metalaxyl, spirotetramat, pendimethalin, perchlorate, permethrine, piperonyl butoxide, phosphonic acid, phosphine, prochloraz, pyrimethanil, tebufenpyrad, thiacloprid and triadimefon. The amounts of these pesticides which were detected were not included in the summary.

With respect to data shown in section 8.3, the German Federal Office for Agriculture and Food emphasized that its compilation has limited informative value regarding the true prevalence of residues in Turkish organic products, because it is based on a risk-based sampling, according to the operators' risk analysis. This comment holds also true for the data in this section. Also, the dataset is limited to those cases which are reported by Member States.

8.5 EFSA Reports on Pesticides

The European food safety authority publishes an annual report summarizing all findings of pesticide residues in food on the market in the EU member states, Norway and Iceland. The report for 2013 was the latest issue available when this analysis was made. It covers a total of 80967 samples of a wide variety of unprocessed raw agricultural commodities and processed food products, including 5423 samples from Turkey.

For Turkish products in general (organic and conventional pooled), the report gives some insight into the prevalence of residues. Of the 5423 Turkish samples, 4038 (=74.4 %) had no detectable residues, 1309 (=24.2 %) had residues up to the MRL, and 76 (=1.4 %) had residues above the MRL. The corresponding values for the 55253 European products are: 31807 (=57.6 %) had no detectable residues, 22665 (=41.0 %) had residues up to the MRL, and 781 (=1.4 %) had residues above the MRL. Thus, considerably more Turkish than European products were residue free, while the percentage of products with residues above the MRL was identical for Turkish and European products.

The findings in organic products are not generally distinguished by country of origin. However, each residue case in organic products exceeding the MRL is shown separately in Table 3-3. According to this table, poppy seeds were the only Turkish organic product where pesticide residues were reported. Diazinon residues were reported in both cases, although it is not possible to determine whether both reports referred to the same food lot or not.

8.6 Conclusions from Complementary Data

Ökomonitoring Baden-Württemberg indicates that among Turkish organic products, dried apricots, raisins / sultanas, hazelnuts and lentils were most strongly affected by pesticide residues.

The BNN monitoring covered too few Turkish organic products to allow any conclusions.

The data provided by the German Federal Office for Agriculture and Food confirms that among Turkish organic products dried apricots, sultanas, hazelnuts and lentils / chickpeas are affected by pesticide residues, and indicates a few more affected commodities.

The dataset provided by the European Commission (which has some overlap with the data from Germany) confirms again that apricots (dried / fresh), sultanas / raisins, hazelnuts and lentils / chickpeas are affected by pesticide residues, and indicates a number of other commodities which are also affected.

The EFSA report 2013 does not contain complete data on residues in Turkish organic products. However, Turkish products in general (organic and conventional) have a lower incidence of pesticide residues than products from Europe, and in Turkish organic products, only two residue cases above the MRL were detected in the year 2013.

9 Major Findings of the Survey

9.1 Frequency of Residue Testing

In the 2013 survey, the great majority of Central European actors stated that they analyse Turkish organic products with the same frequency as organic products from other origins. In the 2016 survey, a small majority still stated that they analyse Turkish organic products with the same frequency as organic products from other origins. However, almost half of the actors stated that they analyse Turkish products more frequently than products from other origins. Thus, the frequency of residue testing on Turkish organic products seems to have increased in the last few years.

Among Turkish actors, there was a slight trend in the direction of more frequent residue testing on organic products. This slight trend which has shown up already in the 2013 survey has apparently continued and is now confirmed in the 2016 survey.

The increase in residue testing is frequently attributed to the following reasons:

- A growing number of organic producers or organic area in Turkey, or a growing turnover of the company with Turkish organic products.
- The development of new single-substance analytical methods, which are not part of the pesticide screening and therefore need to be ordered separately (e.g. glyphosate, DDAC, phosphonate).
- The new rules in the EU regulation specifying minimum sample numbers are also mentioned. These rules were not yet in force during the 2013 survey.

All of these factors might be important in determining the frequency of testing. It is noteworthy that none of them reflect trends in a more critical or negatively evident situation regarding residues in Turkish organic products.

9.2 Residue Cases

A majority of all actors (both Central European and Turkish) has encountered cases of pesticide residues in Turkish organic food products. This was already the case in the 2013 survey, and is now confirmed by the 2016 survey.

In both surveys, a majority of Central European actors state that there is no trend over time, while a minority state that the situation has improved. Among the Turkish actors, a great majority state that the situation has improved.

In both surveys, a majority of the Central European actors stated that residue problems in Turkish organic products are comparable to other countries. However, a considerable minority stated in 2016 that the situation is critical and improvements are necessary. This answer was never given in the 2013 survey.

Apricots and sultanas / raisins were frequently affected by residues according to both surveys. Lentils / chickpeas are also frequently affected, but a decrease over time was noted. These figures are influenced by a big residue case in 2011 – 12 (see below). As far as other crops go, the 2013

survey showed only few records, but many more in the 2016 survey. This holds true for Central European and Turkish actors. In line with this finding, a much larger range of pesticides was reported in the 2016 survey as compared with the 2013 survey. These findings certainly reflect the growing trade volume and diversity of Turkish organic products. However, they probably also reflect an increasing sensitivity of the actors for residues in general and a greater openness to reveal details of residue cases during the 2016 survey.

We hypothesize that the perception of residue problems is greatly dominated by the big residue cases. The most important were the findings of glyphosate in lentils which occurred mainly in 2011 and 2012. Others are the findings of DDAC on strawberries (2011) and dodine on apricots (around 2008). Currently, phosphonate residues are frequently found.

9.3 Detection of Residues

Both Central European and Turkish actors state that residues are most frequently found by the importer. This was the case in the 2013 survey, and was confirmed in the 2016 survey. This situation can be interpreted in different ways and does not necessarily mean that Turkish actors carry out less analyses or detect residues less frequently.

- Positive residue results detected by Turkish exporters mostly lead to an internal down-grading of the respective lot and discontinuation of the export process. Thus such contaminated lots will never reach the organic market and will never come to the attention of the respective CB or the potential clients.
- Central European importers have their own residue monitoring programmes and are not fully relying on residue tests carried out by Turkish CBs or suppliers.
- The survey underlines the importance of residue testing by the private sector, in line with the principle of self-responsibility of all actors in the food chain.

9.4 Communication between Stakeholders

A majority of Central European and Turkish actors is aware that other parties along the trade chain regularly carry out analyses (both surveys).

The surveys inquired about the mutual relationships between the various stakeholders in the trade chain. Some stakeholders reported that they had no experience with certain other stakeholders. Where they had experience, the most frequent answer in both surveys was usually that the other party had acted appropriately. For details, see chapters 4.4.6 – 4.4.6 and 6.4.3 – 6.4.8.

Despite this generally positive pattern, there was some dissatisfaction among European as well as among Turkish actors. Communication issues should be addressed, because there is considerable scope for improvements. This is a matter of communication among most of the actors involved: (1) within Turkey, (2) within Central Europe, and (3) between Turkey and Central Europe. In this regard, the several multiple-stakeholder events organized by the German-Turkish Cooperation throughout phase I and phase II of the project have substantially contributed to the mutual understanding of stakeholders' needs.

9.5 Consequences of Residues

With respect to the consequences for Central European actors, three answers were frequently given:

- The residue case has substantially delayed the marketing (8).
- The residue case has produced additional costs for the company (6).
- Finally the product in question could be marketed as organic (7).

All of these answers go in line with the present practice known to be applied among European CBs. If residues are detected in already imported products, the respective lot is provisionally blocked until additional samples have been tested and the reason of contamination has been examined and if possible determined along the supply chain. Due to the ever more sensitive analysis methods, residues found in organic products are frequently rather low and often only slightly above the detection level. In many cases, the origin of the residues cannot be found and the lot is finally accepted by the CBs to be marketed as organic. Even in this case, a substantial delay in marketing and additional costs for analyses arise, as complained by the European traders.

With respect to the consequences for Turkish actors, the following answers are noteworthy:

- «The residue case has substantially delayed the marketing» and «The residue case has produced additional costs for the company». These answers were given most frequently in 2013, and frequently in 2016.
- «Goods could not be marketed at all». This answer was given only once in 2013, and was the most frequent in 2016.

Whether products with residues can be marketed as organic or not, depends mainly on the strategy of the competent authorities of each country with respect to action levels. The first (and most frequent) strategy is that residues up to 0.01 mg/kg are tolerated. This value is well-known in Germany and elsewhere as the 'BNN orientation value', and it is at the same time the 'action value' of the EOCC residue guideline. The second strategy is a 'zero tolerance' approach, as it is officially applied by the Turkish competent authority MoFAL (Ministry of Food, Agriculture and Livestock). According to this policy, products tested positively when still in Turkey are decertified and cannot be marketed as organic. Several Turkish CBs complained that this is unfair in view of the Central European policy.

9.6 Suspected Causes and Origins of Contamination

European and Turkish actors have similar suspicions about the origins of contamination, and these did not change much from 2013 to 2016. «Contamination in the field» was pointed out most frequently, and «drift from neighbouring conventional fields» was suggested as the most important mechanism.

Other origins were also mentioned. In 2013, «contamination during transport from farm to factory» was rarely pointed out by Central European actors, but frequently by Turkish actors. In 2016, neither Central European nor Turkish actors pointed out this origin frequently.

In 2013, «contamination during processing in the factory» was regularly pointed out by Central European actors, but rarely by Turkish actors. In 2016, both Central European and Turkish actors pointed out this origin frequently.

In 2013, «unintentional commingling with conventional goods» was named second most frequently by Central European as well as Turkish actors. In 2016, this mechanism was named less often by both groups of actors.

«Lack of knowledge» - on farm level as well as on processor level - was identified as the main shortcoming causing contamination, by Central European as well as Turkish actors, and in both surveys. In this respect, see the concept 'Organic Performance Certificate' described in the next chapter.

9.7 Suggestions for Improvements

«Better separation of organic and conventional products» was recommended by Central European actors in 2013 and in 2016. Turkish actors frequently recommended «better labelling of goods and lots», which addresses the same problem on the other side of the supply chain.

«Better cleaning/maintenance» was also frequently recommended (usually second most frequent). Turkish actors also named «better hygiene conditions», which is a topic related to cleaning.

The actors generally agree that the situation should be addressed with better information or training of operators. «Better training of farmers» was most frequently named by Central European as well as Turkish actors and in both surveys. Better training or information of the other stakeholders in the trade chain were also frequently named by all actors and in both surveys. As a possible answer to this, the German-Turkish Cooperation has presented a concept for an 'Organic Performance Certificate'. This will be based on a compulsory training for farmers and processing companies in Turkey wishing to obtain organic certification. Stakeholders of the organic movement in Turkey have shown an interest in this concept, but further work is needed, before it can be implemented in practice (see also chapter 11).

9.8 Overall Pattern

Turkish organic products – like all organic products imported into the EU – undergo residue testing at several stages. As a first step, there is residue testing within the country (mainly by Turkish CBs). As the 2016 survey shows, organic foods where residues were detected often cannot be marketed at all, or at least their marketing is substantially delayed.

As a second step, there is rigorous residue testing by the importers. Both surveys show that most residues are detected at this stage. In many cases, importers inform the CB and wait for a final certification decision. Alternatively, they may immediately refuse the goods. The outcome is either a delay in marketing, or no marketing in Europe. Importers may analyse the foods immediately after import, and/or request pre-shipment samples for analysis. If residues are found in a pre-shipment sample, the food is often not imported.

After these two steps of analysing, most lots with residues (or with residues above the action level) have been removed from the market, as revealed by European food monitoring programmes. In these programmes, Turkish organic products are included along with all other

foods. The EFSA report 2013 on pesticides in food shows no conspicuous features whatsoever for Turkish organic products (see chapter 8.5).

Since a number of years ago, European importers have established a strict regime of residue testing on organic products. This has led to rejections of organic products, including products of Turkish origin. The 2013 survey showed a trend of Turkish exporters and CBs increasing their efforts in the area of residue testing. The 2016 survey shows that this trend has continued to 2015. This causes considerable costs and leads to more frequent rejections before export. On the other hand, fewer Turkish organic foods are rejected after import and Central European importers are generally satisfied with the quality of Turkish organic foods. The more efforts are made for minimization of pesticide residues in the country of origin, the smaller will be the losses in export. The present survey shows this for Turkey, but this is a general pattern which can be observed anywhere.

10 Conclusions on the Performance of the German-Turkish Cooperation

Although the recent survey does not show a significant decrease of pesticide residues in organic products from Turkey, it gives clear evidence that actors in the organic supply chains have become increasingly sensitised and more knowledgeable in regard to dealing with residues throughout the duration of the project. This development strongly contributes to preventing contaminated products from reaching consumer markets in Europe.

It is most likely that the Project has contributed to this trend with many of its activities which focused on various issues in the area of residue occurrence, residue analysis and avoidance by specific preventive measures. There is no doubt that the Project has made significant contributions to raising awareness in the entire value chain and to the continuous sensitisation of the actors for quality issues. The Project's interventions may also have led to more stringent or better targeted checks by the private Turkish control bodies. The important aspect of networking, which has been addressed in several importer-exporter platforms, is likely to have reduced problems related to insufficient communication.

11 Outlook Beyond the Project

Maintaining high quality in food production and trade requires continuous efforts. In this chapter, we therefore outline some activities which might follow up this project.

During this project,it has become evident to the Project team that merely focusing on technical control solutions is not sufficient; . a sustainable quality assurance of exports can only be achieved through comprehensive development of the organic sector in Turkey and a parallel development of a national market. This is confirmed by experience in other countries such as Italy, where a mainly export oriented market later developed also into a strong national market.

Based on the experience gained in the German-Turkish Cooperation project, the following steps seem to be important for further enhancing the potential, the quality and the capacity of the organic market in Turkey:

- Awareness raising activities among Turkish consumers.
- Detailed planning and implementation of pilot projects for the concept of 'Organic Performance Certificate', which will be based on a compulsory training for farmers and processing companies in Turkey wishing to obtain organic certification.
- Moderation of market actors in Turkey to improve infrastructure, cost calculation and capacity of the domestic organic market.
- Supporting Turkish organic control bodies in organizing themselves under an umbrella organization.
- Stimulating trade relations and communication by organizing market research missions in Turkey and abroad.

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List of Abbreviations

CB	Control Body
EOCC	European Organic Certifiers Council
ETO	Association on Organic Agriculture (Ekolojik Tarım Organizasyonu Derneği)
FiBL	Forschungsinstitut für biologischen Landbau (Research institute of Organic Agriculture)
MRL	Maximum Residue Level

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