

# Cases of pesticide residues – Illustrating the decisions taken by control bodies and control authorities in Europe

Deliverable 2.2



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# I. Introduction

The handling of organic products contaminated with pesticide residues is highly diverse within Europe. Also, differences between different actors within the same country can be observed. With regard to the handling in residue cases, the most prominent process of the farmers and processors are to follow instructions of the control body. On the other hand, referring to the approach to evaluate residue cases within the competent authorities (CAs) and the control bodies (CBs) a high diversity is seen. As a consequence, lightly contaminated goods may be accepted as organic product in one country while in another country their organic status would be denied.

The goal of this study is to evaluate the process and the selected criteria of the CBs and CAs based on selected, model cases. The results will be used as an additional base to work out uniform recommendations specifically for CBs and CAs.

# 2. Methods

In order to better understand the work of CBs and CAs and the instruments they use when assessing residue cases, we conducted an online survey using the tool lime survey. In an anonymous questionnaire, respondents were asked about their guiding principles when assessing residue cases and the implications of the current legal situation on their work.

As part of the survey, respondents were asked to assess six hypothetical residue cases, which were based on real examples. For each case respondents had to indicate how they proceed in the evaluation, whether the product can be marketed as organic and the reasons for their decision. Each case was based on an example of a product containing a residue of a substance with a given concentration. Each residue case focused on a different situation:

- Case 1 residue below 0.01 mg/kg
- Case 2 residue case with a measurement uncertainty
- Case 3 residue case of a concentrated product (dealing with a concentration factor)
- Case 4 residue case with a variance within the batch
- Case 5 residue case where multiple origins of the residue are possible
- Case 6 assessment of leaf samples from crops with non-edible leaves

The invitation of the survey was sent to 237 CBs and CAs in Europe in March 2022. The mailing list was based on information provided by European Commission DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT, B.4. Organics LIST OF CONTROL BODIES AND CONTROL AUTHORITIES IN THE ORGANIC SECTOR Valid on 02/03/2022.



## 3. Results and Discussion

The following sections summarize the results of the survey.

### 3.1 **Overview of responses**

In total, 25 respondents from 11 different European countries completed the survey. The details of the origin of the responses are given in Table 1. 24 out of the 25 respondents were CBs and one stated to be a former CEO of a CB.

Country	Nr. of responses
Austria	3
Belgium	2
Bulgaria	I
Croatia	2
Cyprus	I
Germany	2
Ireland	I
Poland	5
Portugal	2
Romania	3
Sweden	I
Without indication of the country	2
Total responses	25

 Table I – Origin of responses



### 3.2 Handling of residue findings

### 3.2.1 Guidelines

Respondents were asked about the guiding principles for the evaluation of residue cases. Figure 1 provides an overview of the answers. It was possible to give more than one answer on the question which guiding principles are used. Nearly all of the participants are using the EU regulation 2018/848 as a guideline. In addition, 15 respondents are using a national guideline and 9 have an internal guideline. 4 respondents are using the EOCC guideline, 3 the IFOAM guideline and 1 is relying on a private label.



#### Figure I: Overview of guiding principles

Overview over the given responses by the CBs on the question "what are your guiding principles for the evaluation of residue cases?" (number of respondents = 25, several answers were possible).

### 3.2.1.1 Investigation of causes

In order to see how detailed the process by the different CAs and CBs is with regard to the residue assessment, we asked the participants whether they investigate the causes of pesticide residues. The results show that more than three quarters of respondents always investigate the causes of pesticide residues, whereas it depends on certain conditions for the remaining 24% (see Figure 2). For the latter group, the most stated condition to make further investigations is in situations with multiple cases from the same organization (5 responses), followed by the suspicion of fraud (4) and a concentration above a threshold value of 0.01 mg/kg (4). Details can be found in Figure 3.





Figure 2: Investigation of causes

Results of the question if the control bodies always investigate the causes of pesticide residues or if it is depending on certain conditions (number of respondents = 25).



Figure 3: Reasons for investigation

Overview of possible conditions to investigate pesticide residues and amount of control bodies that found the conditions relevant (number of respondents = 25, several answers were possible).



### 3.3 Cases

In the following subsections we present the results of the assessment of the different residue cases.

### 3.3.1 Is the provided information enough to take a decision?

For each case a minimum of information was given. This included the product, the type and name of the residue and the detected amount in mg/kg. For example, case 1: Pears contaminated with the fungicide Captan with an amount of 0.00288 mg/kg.

Based on this minimum set on information the CAs and CBs were asked if they are able to take a decision with regard to the marketability as organic. In the six cases 1/3 could decide based on the given information, whereas 2/3 needed to have further elements to be able to take a decision. Only with regard to bromide a higher percentage of 44% could take the decision with the given information. This seems to be due to the fact that the occurrence and problematic of bromide is well known by the CBs. With regard to the cases with a variance in the analytics as well the case with a fosetyl-Al contamination 76% percent needed more information. It is highly complex to determine the reasons of the occurrence of fosetyl-Al, which explains the high rate of CBs and CAs requesting for more information.



Figure 4: Share of the need of more information

Overview over the share of control bodies for which the provided information of the 6 different cases was enough and how many needed more information (number of respondents = 25).

### 3.3.2 Case I

The first case aimed to evaluate the procedure with residues below 0.01 mg/kg. Respondents were asked to base their answers on the following example: Pears, with a residue of the fungicide Captan of 0.00288 mg/kg. Captan is currently in use as a fungicide in conventional pome fruits.





Figure 5: Data collection for the evaluation

Overview over the answers which possibilities the control bodies take to get the needed information to take a decision in Case 1 (number of respondents = 25, several answers were possible).

Figure 5 shows which measures the respondents who need more information took, to get the additional information. 9 respondents followed a structured investigation tool, 10 did a desk study and 7 would make an on-site investigation. Two responders indicated to use other measures to get the needed information.





Percentage of the respondents who decide that the product of case I is marketable as organic or not (number of respondents = 25).

All respondents were asked if they would classify the product of Case 1 as organic. 64% of the respondents assessed the products to be marketable as organic (see Figure 6). In



# contrast, 32% concluded that the product is not marketable as organic. 4% did not answer the question.



#### Figure 7: Reasons for marketability

Overview of possible reasons to declare the product in case I as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

For those respondents who assessed the product to be marketable as organic, the possible reasons for the judgement are shown in Figure 7. Multiple answers per possible reason for the evaluation were given. 9 respondents found the residue to be below a certain threshold, 7 respondents answered, that the residue would probably originate from drift and 4 did a second analysis which resulted in a negative result. Here we can assume that a large part of the CBs is working with a threshold value which indicates the relevance of a threshold value in evaluating residue cases. The selection of drift covers the experience that the most detected residue cases are caused by drift (7 answers in the survey).

The selected answers "natural occurrence" and "origin from microorganisms" are technically not possible contaminations. This indicates that the data needs to be interpreted with caution and that the knowledge regarding the substances is differing between the respondents.

Reflecting that only persons of CAs and CBs were requested it points out that specific education in this field is needed.







Overview of possible reasons to not declare the product in case I as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

With regard of the decision of the non-marketability as organic, 3 stated that the residue is above the threshold value, another 3 assumed that there was an illegal application of the substance and 3 more thought that the residue was probably caused by drift. Reasons such as having past experience with similar cases, contamination during pest control in storage, creation during processing or that the residue was caused by detergents were not considered likely.

The results with regard to the non-marketability as organic are much more diverse than the one with regard to the marketability as organic. Interesting to see is that drift has been chosen 3 times as a reason for a non-compliance as organic. In contradiction 7 respondents see drift as a reason for the marketability, because drift is an unintended contamination. Considering that all respondents came from a CA or CB, the need of education what residues are, where they come from and which are avoidable and which not, is shown again.

### 3.3.3 Case 2

The second case aimed to evaluate the procedure with measurement uncertainty. Respondents were asked to base their answers on the following example: Apple, with a residue of the insecticide chlorpyrifos of 0.0098 – 0.021 mg/kg. In the EU, the use of the insecticide chlorpyrifos is not allowed any more since 2020, but in other countries it is still allowed.





Figure 9: Data collection

Overview over the answers which possibilities the control bodies take to get the needed information to take a decision in case 2 (number of respondents = 25, several answers were possible).

The information about Case 2 was enough to take a decision for 32% of the 25 respondents, 68% needed more elements to take a decision whether the product is organic or not. 7 got this information by following a structured investigation tool, 9 by making a desk study, 5 through an on-site investigation and 3 used other possibilities, as is can be seen in Figure 9.



Figure 10: Rating of the marketability

Percentage of the respondents who decide that the product of case 2 is marketable as organic or not (number of respondents = 25).



A majority of 56% of the respondents came to the conclusion that the product is not marketable as organic in this case. In contrary, 36% said that the product is marketable as organic according to their guidelines. 8% didn't give an answer.



#### Figure 11: Reasons for marketability

Overview of possible reasons to declare the product in case 2 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

Of the respondents who concluded that the product is marketable as organic, 4 stated the reason that the residue is below the threshold value. 3 found a negative result in a second analysis and 3 assumed that the residue was probably caused by drift.



#### Figure 12: Reasons for non conformity

Overview of possible reasons to not declare the product in case 2 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).



Those who assessed the product not to be marketable as organic came to this conclusion through the following reasons: 7 stated the residue is above the threshold value and 7 more assumed the illegal application of the substance. 3 had past experience with similar cases, 3 more thought that the contamination was caused by drift.

Here we see that with the one positive result above 0.01mg/kg the decision about the non- marketability is higher. This shows that the threshold value is a crucial indicator which seems to be the most important criteria for an evaluation.

### 3.3.4 Case 3

The third case aimed to evaluate the procedure with concentration factors. Respondents were asked to base their answers on the following example: Banana (dried), with a residue of the fungicide S-Abscisic Acid of 0.44 mg/kg. The substance S-Abscisic Acid is a fungicide on the one hand and a natural plant hormone on the other hand, which occurs, when the plant is stressed.



#### Figure 13: Data collection

Overview over the answers which possibilities the control bodies take to get the needed information to take a decision in case 3 (number of respondents = 25, several answers were possible).

Case 3 results in similar numbers for the first questions like the two previous cases: 68% need more than the provided information to take a decision whether the product can be sold as organic or not, 32% do have enough elements for this decision of the ones who need more information, 12 followed a structured investigation tool and 12 did a desk study. 7 respondents would do an on-site investigation and 3 got their information from other sources (Figure 13).





Figure 14: Rating of the marketability

Percentage of the respondents who decide that the product of case 3 is marketable as organic or not (number of respondents = 25).

84% of the respondents decided, that the product cannot be marketed as organic in Case 3, 16% concluded that is can be marketed as organic.





Overview of possible reasons to declare the product in case 3 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

Figure 15 shows an overview over the reasons for the decision that the product is marketable as organic. Two respondents assumed a natural occurrence of the contaminant, one did a second analysis which yielded a negative result, one considered the contamination as technically unavoidable, one saw the origin of the residue in



microorganisms, one in drift and one had experience with similar cases in the past. 3 had other reasons to come to that decision.



Figure 16: Reasons for non conformity

Overview of possible reasons to not declare the product in case 3 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

The respondents who decided that the product is not marketable as organic had different reasons for that: For 9 the residue was above the threshold, further 9 assumed the illegal application of the substance. 6 assumed a mix up with conventional products and 5 presumed that a conventional product is sold as organic.

The result shows clearly that the respondents consider the high amount of the residue. Referring to the selected reasons like illegal application, mixing conventional, or selling conventional it seems that the drying factor is not substantially taken into consideration. This could take account on the fact that the commission does not differentiate between fresh and dried products with regard to the residues. To minimize the risk of unjustified decertifications, clear guidance regarding concentration factors is required.

### 3.3.5 Case 4

The fourth case aimed to evaluate the procedure when there is a variance within the analysed batch. Respondents were asked to base their answers on the following example: Wheat, with a residue of the growth regulator chlormequat of 0.02 - 0.07 mg/kg. Chlormequat is a growth regulator and still in use.





Figure 17: Data collection for the evaluation

Overview over the answers which possibilities the control bodies take to get the needed information to take a decision in case 4 (number of respondents = 25, several answers were possible).

24% of the 25 respondents had enough elements to take a decision in case 4. In contrary, 76% would need more information to take the decision. 10 of them followed a structured investigation tool to get the needed information, 12 did a desk study and as well 12 would do an on-site investigation. 2 had other possibilities to get the information.





Percentage of the respondents who decide that the product of case 4 is marketable as organic or not (number of respondents = 25).

The majority of 64% decided that the product is not marketable as organic, whereas it is marketable as organic for the other 36%, which can be seen in Figure 18.







Overview of possible reasons to declare the product in case 4 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

For those respondents who decided the product can be labeled as organic the main reason was that a second analysis yielded in a negative result (5 responses). 2 saw the contamination as technically unavoidable, 2 thought of a natural occurrence and another 2 of drift as the cause for the contamination.



#### Figure 20: Reasons for non conformity

Overview of possible reasons to not declare the product in case 4 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

The majority decided to not let the product be marked as organic. For 7 the reason for this decision was the assumption of an illegal application of the substance, for 6 it was



the residue above the threshold value. 4 respondents thought that the contamination was probably caused by drift, another 4 had past experiences with similar cases. None of the respondents saw pest control during storage or a residue caused by detergents as a possible reason for the contamination.

In this case it can be seen that an additional analysis is the main basis for a decision on the marketability as organic, when there is a variance in the analyzed batch. On the other hand, 7 respondents see the possibility of an illegal application.

### 3.3.6 Case 5

The fifth case aimed to evaluate the procedure when there is a substance with multiple origins. Respondents were asked to base their answers on the following example: Carrot, with a residue of bromide of 2.3 mg/kg. The pesticide used is not bromide, but methyl bromide. In residue analyses, however, Bromide is regarded as a metabolite of Methyl bromide. The use of methyl bromide as a stock protection agent is not allowed anymore in the EU since 2006. Also outside the EU, Methyl bromide is no longer permitted in the vast majority of countries. In a few, however, it still is. Bromide is a natural component of all soils, all waters and all plants. The most frequent cause is therefore natural occurrence.



Figure 21: Data collection for the evaluation

Overview over the answers which possibilities the control bodies take to get the needed information to take a decision in case 5 (number of respondents = 25, several answers were possible).

The description of case 5 provided enough information for 44% of the respondents, 56% would need more elements to take a decision. Of these ones 11 followed a structured investigation tool, 9 did a desk study, 8 an on-site investigation and 3 had other possibilities to get the needed information.





Figure 22: Rating of the marketability

Percentage of the respondents who decide that the product of case 5 is marketable as organic or not (number of respondents = 25).

28% of the respondents answered the question if the product is marketable as organic with "yes", 72% decided that the product is not marketable as organic (see Figure 22).





Overview of possible reasons to declare the product in case 5 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

The most indicated reason to decide that the product can be labeled as organic is the possible natural occurrence of the contaminant (7 responses). 3 of the respondents had past experiences with similar cases.







Overview of possible reasons to not declare the product in case 5 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

For the majority of respondents, the high concentration of the residue was the reason to decertify the example of Case 5 (10 responses). 5 assumed the illegal application of the substance, 3 thought that the contamination came from pest control during storage. Also, in this case the most mentioned reason for the decertification was the threshold value. On the other hand, the decision that the product is marketable as organic is based on the knowledge of the CBs about the occurrence of Bromide. Details are shown in Figure 24.



### 3.3.7 Case 6

The sixth case aimed to evaluate the procedure when looking at leaf samples from crops with non-edible leaves. Respondents were asked to base their answers on the following example: Leaves of grapevine, with a residue of the fungicide fosetyl-Al (sum) of 1.075 mg/kg. Fosetyl-Al is in use in the conventional agriculture. Findings of phosphonic acid have to be converted mathematically to fosetyl-Al (sum).



#### Figure 25: Data collection for the evaluation

Overview over the answers which possibilities the control bodies take to get the needed information to take a decision in case 6 (number of respondents = 25, several answers were possible).

24% of the respondents had enough elements to take a decision for case 6, whereas the majority of 76% needed more information. 10 respondents followed a structured investigation tool to generate the needed elements, 12 did a desk study, 11 opted for an on-site investigation and 3 for other possibilities.





Figure 26: Rating of the marketability

Percentage of the respondents who decide that the product of case 6 is marketable as organic or not (number of respondents = 25).

For 28% of the respondents it is possible to market the product as organic, for 64% it is not marketable as organic and 8% didn't give an answer on that question, as it is shown in Figure 26.





Overview of possible reasons to declare the product in case 6 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

Of the respondents who decided that the product can be sold as organic, 5 had experience with similar cases in the past, 4 thought of natural occurrence of the contaminant, 3 saw the contamination as technically unavoidable and 3 others did a



second analysis which yielded a negative result. (see Figure 27). The high rate of 5 respondents having past experience with similar cases could result from intensive discussions about phosphonic acid residues within the organic sector in the past, based on the complexity of the occurrence of this residue.



#### Figure 28: Reasons for non conformity

Overview of possible reasons to not declare the product in case 6 as organic and number of respondents that found the different reasons relevant (number of respondents = 25, several answers were possible).

A residue above a certain threshold is the most indicated reason for the decision that the product cannot be marketed as organic (8 responses), followed by the assumption of the illegal application of the substance (7 responses) (see Figure 28).



### 3.4 Implications of legal situation

In the last section of the survey, we asked respondents about their opinion on the current legal situation regarding residue handling in Europe. The vast majority (96%) of the respondents would welcome a uniform, more precise guidance for the handling of residues on organic products. Of those, 44% would like to have uniform guidance on the EU level, 4% would prefer it on national level and 48% favor it on both levels. Only 4% do not see the need for a uniform guidance (see Figure 29).



Figure 29: Uniform, more precise guideline on EU level

Percentage of respondents who would welcome a uniform, more precise guideline on EU level, on a national level, on both levels and who would not prefer such a guideline (number of respondents = 25).

The most suggested improvements are the harmonized evaluation of residue cases across Europe and substance specific guidelines for the assessment of residue cases (each 22 responses). Guidelines on the consideration of processing factors would be an important improvement (19 responses) as well as guidelines on the consideration of measurement uncertainty (17 responses). The detailed answers are shown in Figure 30.





#### Figure 30: Improvements

Improvements that could be made regarding the EU guideline and number of respondents that found the different improvements useful (number of respondents = 25, several answers were possible).

The opinions on a decertification level differ. 20% of the survey participants would prefer a de-certification level over the current system, 28% would not prefer that. Half of the respondents do not know or would perhaps prefer a de-certification level (see Figure 31).





Figure 31: Decertification level

Percentage of respondents that would prefer a decertification level over the current system or not (number of respondents = 25).

# 4. Summary and Conclusion

The most prominent rules evaluating residue cases are to follow instructions of the control body. This was indicated in a former survey. Bases for the evaluation of residue cases are the EU legislation as well national guidelines. With regard to the process of handling residue cases the competent authorities (CAs) and the control bodies (CBs) we detected high diversity. As a consequence, lightly contaminated goods may be accepted as organic in one country while in another country their organic status would be denied.

Looking into the details of the process, three quarters of respondents always investigate the causes of pesticide residues, whereas it depends on certain conditions for the remaining quarter. For the latter group, the most stated condition to make further investigations is in situations with multiple cases from the same organization, followed by the suspicion of fraud and a concentration above a threshold value of 0.01 mg/kg.

With regard to the six different cases 1/3 were able to decide based on the given information, 2/3 needed to have further elements to be able to take a decision.

Most of the cases were evaluated as not marketable. This shows that for uncertain cases a decertification is preferred.

A decertification level is seen as helpful by 20%. This is in contradiction to the cases where mostly a threshold value was mentioned as a base for the evaluation and decision.

We can conclude that the actual situation handling with residues on organic products demands to have an equal and traceable handling within the European countries. This



could also help to get an equal and traceable handling for the countries which have an accepted recognition of equivalence of the organic law.

A minimum set of needed information should be defined as a base for an evaluation of a residue case to reach a standardized and equal assessment. As well the need of better knowledge of the substances and the corresponding application could help for a faster, clearer and more traceable evaluation.

To summarize: the unequal evaluation within the CBs could be confirmed with this short case study. A difference in the evaluation process between the different cases could not be evaluated. The need as well the wish from the CAs and CBs for a clearer guidance to have an equal and traceable handling within the European countries can be highlighted. A decertification level is regarded as a useful instrument by 20% of the respondents. More knowledge and education of the CAs and CBs is needed and would be welcome.

## 5. Annex

• Questionnaire: base for programming lime survey





# 6. Funding

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